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Multi-Stakeholder dialogue on sustainable energy and transport

Note by the Secretary-General

Addendum

Discussion paper contributed by workers and trade unions*

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* Prepared by the International Confederation of Free Trade Unions and the Trade Union Advisory Committee to OECD; the views and opinions expressed do not necessarily represent those of the United Nations.

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Workers and Trade Unions In the Energy and Transportation Systems

This 'discussion starter' is produced by trade unions for the Ninth Session of the United Nations Commission on Sustainable Development (CSD), 16 April-5 May 2001, in particular, for the Dialogue Session, which will consider how trade unions, business, local authorities, scientists and NGOs can work together with governments to promote a global transition to sustainable transportation and energy. Trade unions are represented at CSD Dialogue Sessions by the International Confederation of Free Trade Unions (ICFTU) and the Trade Union Advisory Committee to the OECD (TUAC), which, represent over 155 million members in 148 countries and territories. In 2001, they will be joined by the Federation of Chemical, Energy, Mine and General Workers' Unions (ICEM), the International Metal Workers Federation (IMF), the International Transport Workers' Federation (ITF), and the Public Services International (PSI). Trade union participation in the CSD has grown since 1996. As well, we have taken an active role in other international fora on sustainable development issues, including: the Organisation for Economic Cooperation and Development (OECD), Food & Agricultural Organization (FAO), World Health Organisation (WHO), World Trade Organisation (WTO), International Labour Organization (ILO), and the United Nations Environmental Programmes (UNEP).

I. Introduction: sustainable development in energy and transportation

Decision-making in the transport and energy sectors

1. Energy and transportation are two of the most fundamental requirements of economic activity and daily life, as everyone requires them for heating, mobility and industrial activity. However, as we enter the new Millennium, access to clean, safe and sustainable energy and transportation is beyond the reach of nearly a billion of the world's people.

2. Even as they strive to acquire these basic needs of life, workers are increasingly aware of the effect that these two areas are having on the world's environment. In fact, problems relating to energy and transportation illustrate most clearly the close connection between the social and environmental aspects of sustainable development, as overuse by some contrasts sharply to deprivation for others.

3. In particular, global *climate change* and its predicted effects demands immediate attention. It also draws attention to other fundamentally unsustainable features of the energy/transportation nexus, e.g., problems in land usage, pollution, community upheaval, resource depletion, inequitable access, habitat destruction etc., which must be addressed at

the same time. There are numerous other issues which don't have the profile of climate change, but are as needy of resolution. Deteriorating infrastructure, inequitable pricing structures, dysfunctional subsidies, systemic corruption, cannot be ignored; neither can problems of inequitable access, or the condition of those who produce or deliver energy and transportation services. Large segments of the world's population are excluded on all points; they cannot afford the energy or transportation they need, and they play no role in decision-making.

Current patterns reflect unsustainable patterns of decision-making

4. While proposed solutions have focused on science and technology, trade unions believe that the more fundamental issues concern decision-making or governance, i.e., the steady disenfranchisement of people, communities and even whole nations by multinational corporations and business processes that utilize a combination of marketing, pricing practices, political influence and international rule-making. These patterns have been accompanied by trends in public policy-making, service provision and social control that put business needs over the long-term interests of communities, and are a major explanation for the lack of responsible decision-making at this critical point in the history of our planet.

5. *DOWNWARD TRENDS* The failure of national and international decision-making is clearly evident in the failure to find an international response to the pressing issue of *climate change*. As an example, most OECD member countries have yet to identify quantitative measures for their transport sectors, in spite of its overwhelming importance to the achievement of Kyoto emissions reductions targets. It is likewise evident in the downward trends in expenditure on energy research and development (ERD), and in particular, in spending for R&D for renewables and nuclear options,[1] as well as a shift to lower-risk, nearer-term projects. It is also appears in the wholesale adoption of 'liberalisation' policies that transfer key sectors in energy and transportation out of the public sector to private interests and arrangements that exclude democratic, transparent decision-making on issues that impact the public directly, e.g., pricing structures, local environmental impacts, employment, etc.

6. SUBSIDIES AND CONSUMER BEHAVIOR: The failure is also evident is the system of subsidies, which have served to sway consumer choice to more costly and less efficient patterns of behavior and suppress the development of many alternatives. It also creates major

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1 International Energy Agency, Energy Research and Development Database, at: http://data.iea.org/iea/link_wds.asp

inequities with respect to access to mobility, as many people can not afford the costs to own and maintain a car. Often these taxpayers are excluded from the principle form of transportation — automobiles — and must rely on public transit systems that may be inadequate. Consequently, many people are unable to access employment, recreational and other opportunities that require motor vehicle transportation. Moreover, there is inequality in access between those with full access to private motor vehicles and those without, such as children and the disabled.

7. TRANSPARENCY is lost, as the true costs of development and operations are hidden as "external costs" are cast on the whole community, not just the consumers or producers, ignoring the *User Pay* principle, i.e., that those who use a service or resource should pay the full economic cost of that use. Lost are the opportunities to generate finances to support transportation projects, such as transit systems and bicycle and pedestrian options to reduce automobile dependency, or to provide subsidies to alternatives (walking, bicycling, public transit etc.,) that promote our objectives of accessibility, convenience, efficiency, cleanliness and equity.

8. CONCENTRATION OF CONTROL: At the end of 1999, 15 of the largest 25 corporations[2] in the world were in the energy or transportation field, and several other companies listed in Fortune Global 500 had some connections to the field (e.g., shipping and trade). Furthermore, at least three huge mergers last year further increased the concentration of capital and control in the petroleum industry.[3] Trade unions find the trend towards increasing corporate concentration threatening, especially as these companies were already in a position, before the mergers, to exert tremendous political power or influence over national and international policy in transportation and energy.

9. SOCIAL DEMOCRACY: Past CSD Sessions have raised the need for *environmental democracy,* but trade unions believe that the real issue is *social democracy* itself. Not only is the current concentration of power increasingly reducing people and even nations to the role of 'consumers' in an international market; the formal public sector itself is being increasingly bypassed, as its institutions, activities and responsibilities are cut back, privatized and deregulated, particularly evident in energy and transportation. Moreover, governments around

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[2] *Fortune Global 500* list for 2000; ranked by Revenue.

[3] A US$82 billion merger between Exxon Corporation and Mobil Corporation was completed early in the year. In April, the merger of British Petroleum (BP) Amoco with ARCO (Atlantic Richfield Company) created a corporate group worth some US$200 billion. Then, in October, Chevron Corporation agreed to acquire Texaco Inc. for about US$36 billion to create the world's fourth largest oil company.

the world have responded to their new role in a globalised economy with deregulation and retrenchment, in essence abdicating their most basic responsibilities to the people who elected them.

Agreement that current patterns must change

10. An increasing recognition that current patterns of decision-making must be replaced with patterns that are compatible with sustainable development gives us reason for hope. In a recent briefing paper prepared for the United Nations, ICFTU noted:[4]

> *One development, in particular, gives us reason for hope. Trade unions were part of a major cultural shift since 1992 with respect to sustainable development that has affected attitudes, habits and planning priorities at the local and regional level where workers, community groups and business began to address environmental issues. It is particularly apparent at the global level, where criteria for sustainable development are now appearing as priorities for a wide range of international bodies ... most of the credit must go to the inspiration provided by UNCED and Agenda 21.*

11. Awareness of *climate change* and the pressing problems it poses for the future of our planet is rapidly spreading throughout the world's trade unions, as has the direct relationship between emissions and fuel consumption implicit in the rapid growth in private car usage, road and air transport. The fact that oil consumption in the transport sector accounts for 48% of total world oil consumption, and that the overall global warming impact from aircraft emissions could soon surpass the global warming impact of cars, gives us all cause for concern. It is even more disconcerting that current trends show levels of car ownership, usage and congestion, and falling levels of public transport usage. We need to find alternatives. We have broad-based agreement, the technological means, and capacity — particularly with financial flows in the energy sector. Only a lack of political will could stand in the way of broad-based action to make the necessary changes.

12. A fundamental change in public policy is called for, as past approaches have tended to focus only on the most pressing problems, and except for a few isolated cases have failed to address all three pillars of environmental sustainability, particularly the social dimension. Virtually all parties, and member states agree, for example, that a major problem today is the

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[4] ICFTU/TUAC, on ten-year comprehensive review and assessment of implementation of UNCED and preparation for Rio-plus-10, June 2000.

inequitable access to energy and transportation for the world's poorest people. Since the 1992 Rio Summit, trade unions have urged a focus on poverty elimination and employment as key elements of sustainable development, but both depend on a solution to the energy/transportation dilemma. We agree with the OECD that taking a longer-term view requires giving greater emphasis to aspirational goals, the 'precautionary principle', and intergenerational equity', as well as greater weight to environmental and social concerns than in the past, balancing economic priorities.

II. Decision-making at the workplace: a focal point for change

13. In past sessions of the Commission on Sustainable Development, trade unions have highlighted the role of workplaces, workers and trade unions in transition to sustainable development, as contemplated in Chapter 29 of Agenda 21.[5] Workers and trade unions are not only well positioned to promote sustainable workplaces; such efforts are known to produced 'spill-over effects into to workers' homes and communities:

(a) **Workers are the backbone of energy and transportation:** Positive employment and social policies would not only recognize the rights of millions of people who work in these sectors more equitable access to energy and transport; they would assure such basic rights as the right to organize. In the vast majority of workplaces, only a union gives workers any access whatsoever to strategic decision-making, i.e., to *industrial democracy;*

(b) **Workers are consumers of energy and transportation:** In fact, trade union members are amongst the most fortunate workers in the world, because they can usually afford access to basic needs, in contrast to so many non-union counterparts. They are also in a better position to shape new attitudes and practices as consumers, because as the most organized grouping within the energy and transport buying public, they are in a unique position to influence public policies and measures;

(c) **Involvement of workers and trade unions is a prerequisite to substantial change:** Simply put, the workplace is not a democracy, and as such, provides a case study in

[5] Recommendations for trade union action are summarized in a 1997 UN document (ECOSOC E/Cn.17/1977/L.4), which outlines: their place in a sustainable development agenda; the strategic position and capacity of trade unions to contribute; partnerships with employers and governments; voluntary agreements; a central role for the ILO; national reporting and monitoring of workplaces; eco-management and workplace audit practices; and codes of conduct for employment and social justice.

current patterns of decision-making, implementation and evaluation. Not only are workers' interests subordinated; their knowledge and creative energies are often denied a place in the process. Finally, they and their families are the first victims of unsustainable workplaces, as evidenced in high rates of occupational death and injury, and widespread denial of basic worker rights around the world. Even though they are aware of the serious issues arising out of current patterns of in energy and transportation, workers are unlikely to endorse any solutions, if they are imposed from above, by industry or governments. Trade unions have proven to be the only effective vehicles to elicit worker participation for change;

(d) **Trade unions have developed effective models for democratic decision-making**: Highly successful models of democratic decision-making have been introduced by unions in thousands of workplaces in the area of occupational health and safety. These entail workplace assessment,[6] target setting, implementation, evaluation and reporting,[7] and are now being expanded to include the broader scope of sustainable development. For example:

(i) *Occupational health & safety (OHS) committees* are adopting terms of reference and operating procedures that include larger sustainable development issues in the community, as well as national and international spheres. Occupational health & safety committees are widely supported by public policy in many countries and jurisdictions around the world, because they have proven so effective, particularly where unions provide the focus for organizing participation and selecting worker representatives;

(ii) *A tradition of health and safety representatives or 'delegates'* is giving way to OHS&E representatives, worksite 'environmental activists' who are committed to new sustainable development objectives, and are taking their place as members of community, environmental groups and other 'partnerships' in their societies. Delegates normally possess a higher level of training and competence, and just as in

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[6] Workers, their representatives and employers have undertaken workplace assessments to identify where workplace performance can be improved. They lead to joint target-setting, monitoring, record-keeping, and implementation, in tandem with enterprise management systems for environment (e.g. Cleaner Production or ISO), health and safety (e.g. ILO Guidelines or Government regulations), internal or 3rd party enterprise audits, and Government programs (e.g. EMAS). To some extent, they also link with community organisations or local governments, and can also be made to work with collective agreements or other special partnership.

[7] Three fourths of all greenhouse gases come from sources in which waste and pollution can be readily addressed by design and manufacture of clean process equipment and improved technology.

the case of health & safety committees, unionized workplaces in a position to create 'best practice' models for all enterprises;

(iii) *A tradition of collective bargaining*[8] for occupational health & safety rights and protections is expanding to include 'green' issues that reflect the worker's stake in a healthy, sustainable human environment. For most workers, collective bargaining provides the first experiment with democratic decision-making in the workplace, which "green bargaining" extends to include broader social and economic issues;

(iv) A *tradition of union-management 'partnerships' for occupational health & safety* is being expanded to include sustainable development. These "partnerships" contain no expectation that either side should give up its primary goals; they simply imply that employers and workers share an interest in the overall state of the environment;

(v) *Occupational health & safety toolkits* developed to guide health and safety activists through identification, analysis, and response to workplace problems, are now being 'repacked' to accommodate environmental concerns and activities. These toolkits contain practical guides to assessments, structures, and processes, sample letters and forms for all purposes, and sample press releases and petitions, and guides to information sources;

(vi) *A workplace culture of occupational health & safety* is giving way to a workplace culture of sustainable development activists, or 'environmental citizens'. This change in culture is displayed where unions undertake campaigns that go beyond traditional workplace concerns and focus attention on sustainable development issues.

III. Sustainable decision-making: priorities for the ninth session of the Commission

14. Proposals that trade unions bring to CSD2001 are premised on the understanding that fundamental changes are required to the way decisions are made in the energy/transportation nexus. Current patterns of development that disenfranchise people and their communities must be replaced with models of decision-making that centre on involvement, following the

[8] Collective Agreements are legal contracts between employers (or employer associations) and trade unions (as bargaining agents for units of workers), governing terms & conditions of employment, as well as settlement of disputes between parties. Increasingly, they contain green clauses to protect the environment.

lead that the CSD has demonstrated in its annual multi-stakeholder dialogue sessions. Furthermore, these changes must begin in workplaces and involve communities and local authorities in an integrated process that leads to national and international agreements. Past CSD Sessions have already agreed that effective sustainable development policies require constructive dialogue and partnerships between government at all levels, industry, trade unions and civil society, including women's organization, and have recognized a need to extend this dialogue through partnerships with government and industry, as contemplated by Agenda 21. In summary, decision-making for sustainable energy and transportation requires:

- Attention to social dimensions of sustainable development;[9]
- A focus on the workplace and participatory models; a shift to democratic decision-making that values effective innovation, empowerment and personal responsibility;
- Workplace audits, assessments & monitoring of workplaces, that promote worker involvement, and form part of a reliable, properly-resourced inspection system;
- A link to sustainable consumption patterns amongst workers[10] through strategies that focus on making workers and employers more responsible consumers;
- Positive attitudes towards change, with transition programs that recognize, *inter alia,* core labour standards as identified by the ILO's Socio-Economic Security Program;[11]
- A strong public sector presence in core areas of energy and transportation; and,
- Application of workplace indicators to energy and transportation, such as those described in ILO/ACTRAV's *Worker Education Environment,* which utilize ILO standards.

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[9] Social Dimensions refer to alleviation of poverty, security of livelihood, access to food, shelter, water, health & welfare, social security, sanitation, education, transport, and protection of basic human and economic freedoms.

[10] *Ethics of Consumption: The good life, and global stewardship*, ILO –Labour Doc 315671.

[11] *Socio-economic security – a medium-term Work Plan,* ILO, October 1999. It provides definitions for socio-economic security: *Labour market security* — Adequate employment opportunities, through high levels of employment ensured by macro-economic policy; *Employment security* — Protection against arbitrary dismissal, regulations on hiring and firing, imposition of costs on employers, etc.; *Job security* — A niche designated as "occupation or "career", requiring clearly-identifiable skill levels, craft boundaries, job qualifications, restrictive practices, etc.; *Work security* — Protection against accidents and illness at work, through safety and health regulations, limits on working time, unsociable hours, night work, etc.; *Skill reproduction security* — opportunities to gain and retain skills, through apprenticeships, employment training, etc.; *Income security* — Protection of income through minimum wage machinery, wage indexation, comprehensive social security, progressive taxation, etc.; *Representation security*— Protection of a collective voice in the labour market, by independent trade unions and employer associations, with state protection of rights etc.

Topic 1 — Achieving equitable access to clean energy

15. Trade unions do not subscribe to a narrow, market-based approach to 'equity'; we believe it must apply to all the aspects and effects of development, including employment and on developing countries. While problems of unequal access to energy and transportation have been tolerated for decades, growing awareness of climate change is a relatively recent development. Unfortunately, decision-makers have yet to pay attention to the social and employment impacts of *climate change*, even though countless jobs are sure to be lost and communities disrupted, especially in developing countries. This illustrates a general indifference to the social dimensions of sustainable development. Workers or communities can hardly be expected to support climate change measures, or the huge financial commitments they will be necessitate, unless they are assured that the social costs of such change will be spread equitably amongst economic sectors and nations, and that they will be part of designing and implementing transition programs.

(a) **Sustainable development issues in 'developing countries'** — Much of the debate over energy use and emissions has focused on industrialized countries, as they are largely responsible for many of the current problems. Unfortunately, issues facing developing countries are being ignored, even though they will be directly affected by decisions made in boardrooms of industrialized nations. They have their own social problems to deal with, and access to a sustainable energy supply is a key concern for many of these countries, as some two billion people, mainly in the rural areas of developing countries, have no access to modern forms of energy. This requires attention to:

(i) Women, who are key consumers and users of household energy resources and services, but are marginalized, when they should be on the forefront of energy policy-making;[12]

(ii) Reforms to trading rules and international debt, and assessments of the energy needs of countries that take into account such considerations as employment, gender and health effects, and energy needs in rural areas to meet the population's basic needs and to create employment;

[12] Conference of African Ministers Responsible for Development and Utilisation of Energy, See U.S. Department of Minerals and Energy, *Press Release*, 12 December 2000.

(b) **Socio-economic security in the face of change** — Socio-economic security is a prerequisite for worker endorsement of policies and programs for sustainable developments. This concern is not limited to sustainable development only, as workers are experiencing massive job loss, dislocation, disruption and changing rules as part of the "New Economy." 'Globalized companies' in energy and transportation are using workforces on a global basis, along with new production methods, economies of scale, reorganization of the workplace, and intensification of work; the process of market liberalization threatens all aspects of worker security, from health and safety to incomes. The need for equity in 'transition' was graphically illustrated last year, when the last reactor at the Chernobyl nuclear plant was shut down, affecting the station's workforce of around 6,500 people, and at least 5,000 other jobs which depend on them, as well as the community of Slavutych. The lack of adequate funding for transition was not lost on workers around the world. Chernobyl was one of the first challenges of transition — certainly not the last;

(c) **Funding a labour-friendly transition to sustainable development** — Planning for social and employment transition highlights the need for inclusive, democratic decision-making, as decisions made without proper consultation and input of workers and their communities, and even nations have revealed the basic deficiency of current approaches. At minimum, transition programs must include continued livelihood and orderly conversion for workers and affected communities, adequate income protection, access to new jobs, educational assistance and social programs to ensure uninterrupted access to basic needs and services, integrated with alternative energy scenarios, which incorporate "green jobs". Trade unions are develop answers in this area; i.e., the *Plan for a Labour-Friendly Transition* unveiled by the AFL-CIO at COP6 in The Hague showed how a 'Just Transition' to accommodate Kyoto Targets is achievable and affordable;

(d) **Researching employment implications of transition** — Nine years after Rio, employment implications of climate change measures, and sustainable development generally, have yet to be properly studied. Trade unions know that the effect of inattention to the social impacts of transition has always meant a totally inequitable distribution of costs, as workers and their communities bore the cost of a failure by government and industry to address systemic problems. In this respect, the agreement announced at COP6 in the Netherlands, between representatives of trade unions and

business to work together to obtain official recognition of the need for research into employment and social implications of climate change or measures to mitigate its effects;

(e) **Making the case for public ownership and regulation of utilities and vital services** — The generation and distribution of energy and a transportation system are amongst the most basic functions required by industry and community. This need, together with a high level of capitalisation, and dependence on natural resources are conditions for 'natural monopolies'. Trade unions believe that sustainable provision of such 'utilities' calls for an adequate degree of public ownership and regulation, in which responsible, elected authorities can promote objectives of: accessible energy and transportation, energy conservation, waste reduction/recycling, environmentally friendly transportation, education and information, land planning, and land for recreational and protected areas. However, in a growing number of nations and regions, the ability of public utilities to provide quality services on a continuing basis or to respond to rapidly increasing demand has been severely compromised, as national decision-makers are decreasing investment levels and refusing to consider alternatives;

(f) **Confronting the trend towards 'liberalization" of vital energy and transport services** — It is time for the CSD and other international agencies to make a thorough and responsible evaluation of the effect which 'liberalisation' experiments have had on energy and transportation in both industrialized and developing nations. The Public Services International (PSI) has begun its own enquiries into the effects of several of these, and has concluded that they make a strong case for public sector provisions. Cash-strapped governments are increasingly resorting to Independent Power Producers (IPPs) for power generation,[13] water utilities, and waste, and are allowing the private sector to operate without extensive regulations, as the conditions of operating are specified in the terms of the contract itself. As well, the PSI has studied the effects of liberalization in Nordic countries, where regimes which have stabilised supply of electricity at some of the lowest prices in the industrialised world have been replaced by regimes in which planning which is increasingly susceptible to market forces[14] Evidence calls for a re-evaluation of the relative financial, industrial, environmental, and economic advantages of different forms of finance and investment into vital utilities, as well as an evaluation of the impact

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[13] Kate Bayliss and David Hall, PSIRU, University of Greenwich *Independent Power Producers: A review of the issues.* Report commissioned by the Public Services International, November 2000.

[14] Sam Weinstein, PSIRU, University of Greenwich, *The Nordic Energy Market*, Report commissioned by the Public Services International, January 2001.

of World Bank/IMF conditionalities and their effect on the decision-making process in these cases.

Topic 2 — Choices for production, distribution and consumption of energy

16. Decision-making that is compatible with sustainable development places a high value on education and information to change attitudes and behaviour. Trade unions have developed educational capacity for workplace-centred education; in fact, they are the foremost providers of adult education in many countries, a capacity that can be readily harnessed to the goal of changing unsustainable habits and attitudes. A number of unions have initiated such programs relating to energy usage and transportation, and see local governments as natural allies, noting that this level of government has already implemented a number of innovative schemes, to reduce energy use and emissions generally. Governments at all levels must do much more to twin the education of consumers with the implementation of programs promoting sustainable energy choices. Information for consumers must be provided about contract terms, cost, generation sources, and emissions characteristics of utility power being supplied. In this regard, occupational health & safety programs developed by trade unions can serve as a model for education at the workplace, and are extended to community action:

(a) **National plans for reduction of greenhouse gas emissions and pollution** — Although agreement on specific implementation measures was not achieved at the Hague, many Member States have already responded to the Kyoto Protocol by designing and implementing national programs for reductions of greenhouse gas emissions (GHG) within the framework of national sustainable development programs. Recent events at The Hague and elsewhere have shown that agreement and participation of workers and their representatives are essential to the support for national programmes. By the same token, the contribution of German and Danish trade unions to initiatives in their countries illustrate what is possible once barriers to broad-based worker acceptance are brought down;

(b) **Cooperation for alternative energy initiatives** — The labour movement unites workers in actions across national boundaries, even when governments cannot agree. The potential for this has been illustrated by the LO-Denmark and the Spanish trade union central (CC OO), who have collaborated on a scheme to develop wind power in the Pyrenees. Likewise, collaboration is taking place in urban planning reform, and employer-worker enterprise assessments/audits to meet community targets. This capacity is also key to bridging the gap between producers and consumers, and to balance the

influence of multinationals with a worldwide network of affiliated organizations. However, it requires greater cooperation with governments and international agencies;

(c) **International agreements: 'Voluntary agreements'** — Recent international agreements between unions and multinational corporations in the energy field display the potential for Voluntary Agreements (VA's) in an increasingly globalized economy. The best-known VA in the energy and chemicals industries, *Responsible Care*, has illustrated both shortcomings and strengths. Broad consensus has been reached among trade unions, business and NGO's that VA's must form part of a mix of solutions, including regulation and standard setting.[15] Last year, the International Federation of Chemical, Energy, Mine and General Workers' Unions (ICEM) signed an agreement with German-based Freudenberg (affecting all subsidiaries) that recognises union rights, workplace equality, health, safety and the environment, a ban on child and forced labour, full cooperation and consultation with workers and unions as the best way to further the interests of the company and its shareholders.[16] As well, an agreement is imminent with chemical manufacturers worldwide. When combined with the recent *OECD Guidelines for Multinational Corporations*, these agreements show that international action can be taken to balance the control of multinational corporations in the field;

(d) **Trade union involvement in design, implementation, verification and reporting** —Trade unions have promoted sustainable development objectives through audits, assessments & monitoring of workplaces, and have played a role in designing and implementing effective tools for workplace monitoring and research. These promote the kind of worker involvement that results in improvement to their own health and safety, as well as to the community environment. As well, central trade union bodies have developed considerable capacity for participating directly in international bodies, and serving in an advisory capacity on others. The work of the International Transport Workers' Federation (ITF) in the ICAO and IMO provides an example how unions can contribute to informed, responsible management at the international level. Promotion of standards, however, must be backed by effective system for enforcing the measures

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[15] A multistakeholder consultation held in Toronto in 1999 reached agreement following the CSD1998 Dialogue Session on "Business & Industry".

[16] For example: HOCHTIEF, one of the world's largest construction groups, has signed an agreement with the General Works Council, the German Construction Workers' Union, IG BAU, and the International Federation of Building and Wood Workers (IFBWW) committing it to observe anywhere in the world the standards contained in ILO Conventions and Standards. It includes HOCHTIEF's subcontractors.

needed; i.e., adequately resourced and effective inspection systems through which governments can monitor and enforce agreed standards.

Topic 3 — Public-private partnerships for sustainable transportation

17. Trade unions support public-private 'partnerships', but only when they are truly based on a democratic relationship between parties for mutual benefit. Partnerships between public sector institutions, industry, trade unions and NGO's can provide strength and synergy, and just as importantly, can lead to cooperation where parties may otherwise operate at cross-purposes. As such, they have special relevance for the workplace, where they can help to overcome barriers caused by the adversarial nature of the employment relationship. Partnerships beyond the workplace (e.g., Local Agenda 21 Committees) can reorient current development planning, protect land and ensure accessibility to all groups etc. Finally, partnerships can effectively direct attention to working condition in the core industries:

(a) **Confronting the urban transport juggernaut** — Transport is a basic need, but in urban centres, unsustainable patterns have led to increases in levels of CO2 emissions, in addition to other impacts, and trends towards even higher fuel consumption/ higher emission vehicles and falling rates in usage for public transit mean that action is desperately needed. An immediate environmental priority is for improved urban planning itself, as current patterns favour use of private automobile, both in the way human settlements are planned and in the allocation of funds and subsidies that place public transit at a disadvantage. A number of workplace targets could be set around urban transport,[17] and integrated workplace assessments could promote scrutiny of all workplace resource use and opportunities for joint action; e.g., passenger information services, public transport incentives for employees, education and awareness-raising programs, support to local initiatives and marketing and image campaigning for walking, cycling and using public transport;

(b) **Addressing the problem of transportation to-and-from work** — Workers and their trade unions have shown that they can take action, together with employers, local authorities, and community groups, to reduce use of private passenger cars and other urban transportation problem. For example, Spanish trade unions (the UGT and CC OO)

[17] Energy suffers from consumption patterns that rely on non-renewable sources of energy, and carry heavy environmental costs. This sector is perhaps most illustrative of the resource-use disparity that divides

have combined to change the focus of urban transport through workplace worker and workplace-generated solutions[18] that focus on commuting to work. Likewise, the International Transport Workers' Federation (ITF) has struck an Urban Transport Committee to monitor the development of urban transport, working conditions of operating staff, and health and safety problems related to this area. A joint ITF/PSI Urban Transport Working Group has been set up to work for the promotion of public urban transport, which can only function effectively with an efficient system of public transport services under public control and planned as a network;

(c) **Establishing the link between worker and public health & safety** — Democratic decision-making would immediately correct the lack of attention to worker health and safety in this area, which contrasts with the widespread acknowledgement of public safety issues. Of 1.2 million work-related fatalities in the world, about 320,000 take place in transport-related activities, within all industrial sectors each year. Fatigue and stress, violence, musculoskeletal disorders, and repetitive work impacts are increasinging rapidly. Workers who are involved in joint workplace governance structures are effective at identifying hazards, proposing and implementing programs for prevention, whether for public or worker health and safety. The ITF has worked with transportation unions, as well as the ICAO and the IMO, to make the link between public (operational) safety and sustainable development by referring to the importance of 'human factors'. The current fragmentation of the industry breaks the safety chain, as direct responsibility of operators is replaced by a web of legal/contractual relationships. The ITF has emphasized Professional Standards for employees, and asked for State-regulated training standards and licensing for all safety-related staff;

(d) **HIV/AIDS as a sustainable development issue — The occupational link.** HIV/AIDS has spread throughout the world, especially in sub-Saharan Africa, to the level of an unprecedented human tragedy. Transportation and medical activities have become central in the spread of the disease, and workplaces are increasingly considered as targets. Policy initiatives undertaken by International Trade Secretariats on the pandemic of

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industrialized from 'developing' countries, and shows how the energy-intensive production cycles, life-styles, and public policies of industrialized countries are most in need of change.

[18] Prague Conference 2000, "All citizens should benefit from the access transport services, provided in a reasonably equitable manner. This implies avoiding excessive dependence on private automobiles, if certain sections of society are not to be excluded". ECMT, *Sustainable Transport Policies*, 2000, p. 8.

HIV/AIDS in Sub-Sahara Africa focus on workplace-centred response to HIV/AIDS, because the virus is most prevalent amongst adults of working age, and because the workplace plays such a central role in their lives. Not only can unions provide the sensitive leadership that is needed; they are well situated to respond because of their extensive membership, overall organizational capacity, and their dynamic ties to such international labour bodies as the ILO. It is clear, however, that the cooperation of other international bodies, social partners and national governments is required;

(e) **Turning the tide on a race to the 'competitive bottom' in transport** — Nowhere is the potential for effective partnerships more evident that in efforts to stop a 'race to the bottom' facilitated by global restructuring, deregulation, privatization and contracting-out, which has contributed to a drop in service, in public health and safety, and in terms and conditions of employment, as well as an increase in waste and expense. This 'race' is evident in the trend towards 'owner workers', or 'contractors' in some transport sub-sectors, and in the 'Flags of Convenience' (FoC's), mechanisms established by companies specifically to avoid national taxation, social, safety and environmental legislation. Working with international bodies, such as ICAO and the IMO, the ITF has publicized the need to counter these developments with effective inspections, training standards and key additions to international law. The ITF was also instrumental in establishing an International Commission on Shipping (ICONS), a fully-independent body to ensure that universal standards negotiated with employers' organization are implemented to ensure that all international merchant shipping is safe and environmentally responsible (including a minimum wage level);

(f) **Utilizing public/private 'partnerships' in government service** — Trade unions believe that local and regional government, by its very nature, is in the best position to provide for utilities and services in the energy/transportation nexus. They have developed unmatched capacity in all areas of transportation, energy supply, waste disposal, water supply and sewage disposal, roads, communication and increasingly, in new information technology systems — and it is vital that these remain under their control and within the public sector. They have been effective in enlisting the cooperation of the private sector and stimulating change through community involvement; e.g., Denmark's "Green Cities". Democracy works best at the local level, and trade unions seek to make common cause with employers, governments, public education institutions, NGO's, consumer organizations and public research bodies to promote these aims. Government can also

provide leadership to promote best practices regarding fuel and vehicle uses; e.g., it can use its purchasing power to buy fuel-efficient vehicles and new vehicle technologies, thereby sending 'market signals' for more sustainable products. It can also achieve cleaner transport by downsizing the number of vehicles, minimizing use and employing alternative vehicle and transport options;

(g) **Assessing demands on the public sector in the transition process** — The public sector has a key role to play in responding to problems created by unsustainable patterns in energy and transportation, and in promoting popular discussion, education and democratic decision-making. National and local health care systems will not only be sorely tested by health problems relating to climate change; they also have a clear role in providing mass public transport. A closely related priority calls for public sector research and information, as the education and capacity-building so vital to a sustainable future require adequate support for independent research, and monitoring, and a science policy that is independent of commercial interests. Finally, government and the public sector must provide a strong and reliable regulatory regime, complemented by voluntary initiatives and backed by an effective, adequately staffed inspectorate, a function which has been diminished considerably in the 'New Economy'. From this perspective, nations and local governments can do much more to utilise regulations, standards and codes as educational tools to mold attitudes towards sustainable and socially responsible forms of behaviour.

Topic 4 — Sustainable transport planning: Choices and models for human settlement designs and vehicle alternatives

18. Unsustainable energy and transportation practices, habits and attitudes are closely intertwined with patterns of human settlement that are deeply-ingrained in the economic and cultural fabric of society. Changes to transportation must be closely tied to changes in urban planning and development, as current patterns favour private forms of transportation, against public transport and other less energy-intensive modes, resulting in the fragmentation of neighbourhoods and lowers the quality of life in the centre. Subsidies that sway consumers to more costly and less efficient patterns of behavior and suppress alternatives, and many of the 'external costs' must be addressed by economic instruments based on the *User Pay* principle can also assist local governments to generate finances to support transportation projects such as transit systems that reduce automobile dependency. Democratically planned transportation

systems must be integrated within the urban layout and with land-use planning to support more sustainable transport modes, such as public transit, bicycling, and walking.

19. Trade unions have their roots in community action, and therefore have the experience and capacity to assist in local planning and action. We know that one of the most effective centres for communication and education can be the workplace, and that worker participation in changes at the point of production can provide the basis upon which all parties can increase their awareness of environmental and social issues, and build new attitudes towards personal consumption and lifestyles in homes and communities. Trade unions have the capacity to provide education and communication that "empowers" workers to take full responsibility for themselves, their fellow workers, and the community, especially with training, education and information systems which have been developed for occupational health and safety:

(a) **Workplace education and training as key to 'quantum leaps'** — Public understanding of energy and environment issues in transportation remains weak. Workplace education processes can do much to change this, especially where they represent a fundamental change in management programs to include participation by workers and their representatives. The work done by the Spanish Unión General de Trabajadores (UGT) is based on rank-and-file action to educate and mobilize trade union members on all three pillars of the sustainable development agenda. It begins with the concrete experience of union and community members (as opposed to an 'expert' approach), uses rank-and-file research into environmental problems and examines legal and trade union instruments that can be employed in both the community and workplace culture.[19] Trade unions believe that the full and open exchange of scientific and technological data and information is critical for research and education. Unfortunately barriers to such data and information are multiplying with public sector cutbacks and corporate takeover, representing a serious risk to the research and education, particularly for developing countries;

(b) **The importance of regulations and inspections** — Models based on worksite health and safety committees must include a major role for regulation, especially given the institutional landscape of transportation. Even national OHS legislation cannot be fully applied to vehicles, especially where these go outside national boundaries, nor can they be left to operational safety bodies like national aviation authorities and motor vehicle inspectors, who often have no specialised knowledge of health and safety, or the

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19 UGT-PV, *Guia sindical; en material de Medio Ambiente*.

environment. In transport it is the *operational* safety regulators (e.g. civil aviation authority) that play a key role in setting both operational safety, OHS and environmental standards. In air and sea transport these are increasingly being set to international standards through ICAO and the IMO, two key bodies in the establishment and maintenance of industry standards;

(c) **Extending producer responsibility** — Trends in municipal waste clearly illustrate the unsustainability of current patterns of production and consumption, as the annual generation of municipal waste (MW) in OECD countries increased by about 40% between 1980 and 1997, and projections are that it is likely to increase by another 50% until 2020.[20] Waste and obsolescence have become major issues for human settlement, and 'scrapping' of ships, trains, cars, truck and planes is a part of it. A review of policy options should extend producer responsibility (EPR) for post-consumer (or 'cradle-to-grave') phase of goods, vesting responsibility in those who produce and distribute products, and serving to change consumer demand. Trade unions are in a good position to play a central role, especially with enterprise assessments and eco-audit schemes that can be utilized to increase awareness. Two areas require immediate attention: (i) ship-scrapping, one of the dirtiest and most unsustainable areas, in which labour rights and guarantees are ignored, as are the most basic environmental concerns; and (ii) toxic and hazardous products that are being transported long distances, often to be dumped in developing countries;

(d) **Reinforcing and supporting a central role for local authorities** — The critical role local governments play in the energy and transportation management picture needs to be acknowledged. The municipal level of government can boast a long tradition of union-management cooperation. We can provide valuable assistance in the planning, design and building of cities and other local centres to introduce efficiencies in energy use and equitable access to transportation, utilising factors that are either wholly or partly controlled by local governments. Trade unions support ICLEI in its position, that local government can play a central role in achieving cleaner and more sustainable energy and transport.

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20 OECD, *Environmental Outlook, October 2000,* chapter 16.

IV. Priorities for the Commission on Sustainable Development

20. Member States and major groups must do more to promote the Commission on Sustainable Development as an international force, and the CSD, for its part, must continue to lead with principled approaches to Agenda 21. In addition, the CSD must continue to promote the participation of major groups (an area in which it has broken ground), by focusing on the unique contributions they can make. Accordingly, we propose the following for CSD2001:

(a) *Promoting policy changes in member countries*; in particular, by highlighting policy changes and successful experiments in Member States that provide leadership to others;

(b) *Promoting major policy changes that look to the long term* E.g., given the importance of transport to Kyoto targets, member states must move immediately to identify quantitative measures for their transport sectors that will contribute to meeting their targets;

(c) *Building consensus with stakeholders:* The CSD to insist on public participation in international bodies that deal with energy, transportation and human settlement by promoting full engagement of civil society, including NGO's and trade unions;

(d) *Promoting a new workplace culture of cooperation*: The CSD to promote good industrial relations as a tool for sustainable development; e.g., by acknowledging the 3.3 million collective agreements in the world that signify worker/employee cooperation;

(e) *Promoting workplace and community models of democratic decision-making* by promoting the stake that workers and communities have in planning, implementing, monitoring and evaluation[21] of policies and programs for sustainable energy and transportation;

(f) *Targeting financial flows in the energy sector for funding transition and other social costs*, especially the financial flows generated by the global energy sector, to finance adequate transition programs. Workers and their representatives must play a central role to ensure that funds are effectively applied, and that past mistakes with 'adjustment' programs are not repeated;

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[21] An overwhelming consensus which emerged from CSD99 Dialogue Session on Tourism.

(g) *Conducting a critical examination of support and subsidies:* The trade union movement calls on the CSD to respond to growing demands for a review of subsidies in the transportation/energy nexus, as a growing number of studies [22] show that many work directly against the goal of sustainable development, and that their removal would result in substantial reductions in CO2 emissions, at the same time as they would stimulate economic growth.[23] The review should also identify subsidies and fees that exist for sound policy reasons; e.g., to promote the use of public transport, or transition programs;

(h) *Reinforcing a central role for government*: Trade unions call on the CSD to promote the role of a strong public sector and improved regulation, complemented with voluntary approaches, to achieve sustainable development aims in energy and transportation. There is a clear need to reinforce public policy through inspection systems, complemented by workplace assessments and reporting systems, at both the local and national levels;

(i) *Promoting capacity building strategies* The CSD can do much to promote capacity building in developed and developing countries alike, with education and information, based on sound research. Workers and trade unions can play a part in building trade, investments, technology and regulatory capability as the basis of policy decisions;

(j) *Twinning the "Income-Poverty" nexus with the Energy-Transport nexus:* The CSD must continue to promote these themes, as they are essential components of sustainability. Workplace assessments around these themes can ensure that market and public policy measures are linked to concrete implementation programs to address hot spots and target groupings;

(k) *Promoting the new OECD Guidelines for Multinational Enterprises*[24] to come to terms with the tremendous increase in power and influence of multinational corporations in energy and transportation. Trade unions participated in development of these guidelines and are pleased that they include implementation procedures, as well as disclosure and performance rules on employment and industrial relations, health, safety, bribery, etc. We look forward to participating in ongoing review and implementation;

(l) *Promoting the vital role of international organizations* The trade union movement plays a central role in the ILO, and we applaud recent initiatives it has undertaken to

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[22] For example, see OECD, *Reforming Energy and Transport Subsidies, 2000.*

[23] A study by European Ministers of Transport (ECMT) revealed significant room in transportation pricing structures, taxes, and other financial measures to 'internalize' costs of unsustainable practices and noted where existing subsidies encourage the wrong types of services.

[24] OECD, *Guidelines for Multinational Enterprises,* 2000.

highlight the importance of the social dimension as it affects workers and their communities. We also view our role in the OECD as crucial, and as well, welcome recent opportunities to participate in UNEP, WHO and Meetings of the Ministers of the Environment;

(m) *Pursuing strategies in the context of an international commitment to change.* The CSD has provided leadership in the international context, and must continue to promote change shaped by such requirements as: polluter pays, transparency, independent monitoring, and observance of International Human Rights. It must continue to promote:

- Sustainable management of the global economy, consistent with growing concern over the social impacts of globalization, the power of multinational corporations, and the concentration of resources, influence, and decision-making power;
- Bringing national energy and transportation policies into the framework of international agreements and protocols, with mechanisms that allow consumers and governments to identify nations and suppliers that violate sustainable development standards;
- Linking energy, transportation and natural resource issues to labour policies; e.g., by promoting substantive cooperation between the WTO and the ILO to ensure that social standards, including labour standards, become integral to all trade-producing activity;
- Integrating energy and transportation policy with other policy areas, most notably: land use, poverty, water and energy on which Member States have agreed since 1992, as well as such agreements and accords at such events as the Copenhagen Social Summit;
- *Promoting international attention to the Social Dimension and Just Transition.*[25] The CSD has been instrumental in promoting Secretary-General Kofi Annan's 1999 call to support core values in human rights, labour standards, and environmental practices;

(n) *Leading the way to new social and economic priorities* Problems of unsustainable development in the energy and transportation will never be solved for developing countries or the economically disadvantaged in industrialized nations, unless social and economic priorities are included. Public opposition to the globalization agenda has

[25] TUAC note *to OECD, Liaison Committee with Inter-governmental Organisations* (Paris, 1999).

prompted calls[26] for trading rules that benefit the world's poor at the same time as they contribute to sustainable development. The CSD must call on international bodies to chart a path towards a world prosperity that focuses on:

- New ways to govern and work with transnational corporations, taking direction from the OECD process to regulate and control their conduct;[27]
- Action on trade rules concerning least developed countries, which could be impacted most heavily by any changes to make energy and transportation more sustainable;
- Changes in international organizations such as the World Bank and IMF to change the terms of debt relief to serve such goals as poverty reduction;
- Differential treatment for the least developed countries to allow them to protect their interests; e.g., incentives to promote transfer of beneficial technology to them;
- Use of trading and investment power to influence observance of human rights, labour and environmental standards.

21. Trade unions have the experience, competence and organizational capacity to participate in all of the above objectives. We are a worldwide movement, capable of linking the local and international levels in pursuit of a sustainable, peaceful and just world.

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[26] This sentiment was expressed in the Financial Times, *If free trade is to serve its purpose, it must not result in a race to the bottom Only negotiated, enforceable minimum standards can solve problems in basic areas like protecting workers and the environment.* R. E. Lighthizer, *FT,* Dec. 4-5, 1999.

[27] OECD, *Towards the Effective Implementation of the OECD Guidelines for Multinational Enterprises* (DAFFE/IME/WPG(99)).

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Multi-stake holder dialogue on sustainable energy and transport

Note by the Secretary-General

Addendum

Discussion paper contributed by local authorities*

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Introduction

1. Air pollution, global climate change and inequitable access to fulfill energy needs are the most visible and pressing concerns resulting from the current fossil fuel based energy system. Other environmental and social stresses such as water pollution, residual pollution in soils and plant matter, loss of green spaces and habitat, and disproportionate burden on poor populations are also caused by the production and final use of fossil fuels for transport and stationary energy.

2. The impact of vehicles bears particular emphasis. Fossil fuel combustion vehicles are the largest source of urban air pollution, a significant and growing contributor to the emissions causing climate change, and a large indirect source of ecosystem stress resulting from the infrastructure required to support vehicle use, e.g.: roads, fueling stations, parking lots.

3. National governments, through national energy policies, operation of centralized or national electric utilities, tax policies and subsidies to certain energy sources, strongly influence the quantity and source of energy used within a country. National policies also strongly influence all aspects of transportation including infrastructure, vehicle manufacture and transportation modes. Through the promotion of particular energy and infrastructure policies and the financing of large centralized energy generation and transportation projects such as road expansion, international donor agencies and multilateral financial institutions also have a significant influence on a country's transportation and energy systems. To date, most of these policies have given preference to energy and transportation systems that are environmentally and socially unsustainable.

4. To achieve clean and sustainable energy and transportation, changes are necessary. How energy is generated and distributed, the sources of energy used to produce electricity and fuel

transportation, as well as changes in the demand for energy and the demand and mode choices for transportation must be put in place. These changes need to come from all levels of government and international agencies and with the cooperation and participation of the private sector. Local governments particularly have a vital role to play in transforming energy and transport to practices that are environmentally and socially sustainable. Although local governments are generally in the background of the debate, they, in fact, have significant influence on energy and transport demand.

5. ICLEI's effort to understand the relationship between urbanization, local government policy, energy use and climate change began in 1991 through the Urban CO_2 Reduction Project. This project analyzed 14 American, Canadian, and European cities to understand local government's role in affecting stationery and transport energy use. The research revealed a striking correlation between the level of energy use in a community with factors such as population density, type of infrastructure, land use patterns, presence of transit options and transit system design, and local building design.

6. Details in the planning, design and building of the European cities provided efficiencies in energy use that were absent in North American cities. Energy efficient cities balanced transit with automobile infrastructure, had land use policies which combined rather than separated housing jobs and services, and incorporated smaller scale energy distribution systems such as district heating and cooling systems. These factors, which are often wholly or partly controlled by local governments, have profound and long-lasting effects on the sources of and quantity of stationary energy and transport fuel used, which in turn affects the level of air pollution and greenhouse gas emissions.

7. The critical role local governments play in the energy and transportation management picture need to be acknowledged. Among the factors that make local governments a logical inclusion in the equation to achieve cleaner and more sustainable energy and transport are:

(i) Decentralization of powers and authority from national governments to lower levels of government is expanding rapidly worldwide.

(ii) Local governments own and operate buildings, vehicles, and facilities such as street

lighting, and water supply and treatment, which directly consume large quantities of fuel and electricity.

(iii) Local governments often control local land use policies, determining where buildings and development are located and the mix of uses that are allowed which in turn affect transportation and energy use.

(iv) Local governments make or exert influence on road, transportation and transit system decisions and investments.

(v) Local governments often have regulatory influence or responsibility for building codes, determining the energy efficiency of the local building stock.

(vi) Local governments manage and regulate vehicle parking, traffic flow and transit systems influencing choice of travel mode and length of trip -significant determiners of transportation energy use.

8. Local governments, national governments and international agencies utilizing the full range of their regulatory, statutory and financial powers are key to achieving sustainable energy and transportation practices. Research indicates that when cities plan and develop with energy efficiency in mind, per capita energy consumption for residential and transportation needs can be cut by several tens of percent from typical levels. Forward thinking national governments and monetary agencies will understand that initial build in or inclusion of technologies for clean energy, energy efficiency and low GHG emissions come at a much lower cost than the cost required to retrofit such systems and technologies later. The rate of development and the enormity of infrastructure investments in developing country cities lends an even stronger rationale for facilitating effective, local urban energy and transportation management at the onset.

Topic 1: Achieving Equitable Access to Cleaner Energy

9. Burning fossil fuels to produce energy is the major cause worldwide of air pollution, acid rain and global climate change. Populations that lack access to a formalized energy system are not dependent on large-scale fossil fuel energy generation. Nonetheless, their lack of access to the formal energy system to fulfill needs such as heating and cooking has other serious

environmental and social consequences. More than two billion people throughout the world do not have access to electricity and continue to use traditional fuels for basic energy needs. Dependence, for example, on wood fuel results in land clearing, serious land degradation and loss of animal and plant habitat. The dependence on coal bricks, paraffin or other forms of portable fuel burned in inefficient and dangerous stoves have serious health consequences and costs that are disproportionate to the users income and the quantity of energy that is produced. Poor urban households also spend a significant proportion of their limited cash incomes on energy.

10. Access to energy and energy reliability are major issues that affect all regions of the world, though it currently impacts developing countries more severely than countries with high GNP and high per capita energy use. The lack of energy stability hurts economic growth and productivity and stymies efforts to alleviate poverty and environmental degradation.

11. Achieving equitable access to cleaner energy can be facilitated through: (i) leveling the economic playing field between fossil fuels and cleaner or renewable energy sources and between centralized versus decentralized energy generation, (ii) facilitating local level and decentralized energy generation, (iii) employing demand side measures to extend existing energy resources, and (iv) utilizing public investment to support clean energy infrastructure.

12. National subsidies on fossil fuel extraction and production inhibit economic viability of renewable energy sources. Rather than create conditions to encourage a transition to greater energy efficiency and lower energy use, governments tend to intensify problems by subsidizing energy production and consumption. Reducing permanent subsidies would improve market competitiveness for new technologies while yielding the added benefits of improving market efficiency and of considerably decreasing the burden on public spending. Renewable energy sources are thwarted by national and local taxes, subsidies and other policies that subsidize fossil fuel based energy and inhibit development of new renewable technologies and applications.

13. Research and development funds from national governments, and international monetary and donor agencies need to be directed to achieve the production of state of the art clean technologies

and renewable energy generation. Many promising renewable energy technologies for meeting sustainable development objectives require relatively modest research and development investments. The World Energy Council has estimated that the research and development expenditures needed world-wide over the next 20 years to advance a range of solar energy technologies is approximately US$8 billion. After the research phase, the high costs of the development process can be reduced with smaller scale renewable energy technologies.

14. Renewable energy sources can also be used to satisfy many of the energy service needs of growing urban populations. There are large numbers of people living in rural or remote areas where grid extension remains prohibitive based on infrastructure costs. Decentralised, renewable energy applications offer alternatives for the provision of affordable energy services while supporting local development and improved quality of life. Local government is an appropriate level of government to promote and facilitate the development of decentralised, renewable energy generation.

15. Renewable energy applications are available for space and water heating, electricity generation, and transportation. In Israel, for example, solar collectors are currently used to supply hot water for over 75% of Israeli homes. Generally, these energy sources neither pollute nor threaten public health. Renewable sources of energy are now reaching commercial viability due to technology improvements and decreasing prices. Solar, wind, geothermal, and commercial biomass options offer practical and attractive alternatives to conventional energy sources.

Case 1: COMPREHENSIVE SOLAR ENERGY INITIATIVE, Saarbrücken, Germany

- The City of Saarbrücken has a population of 190,000 and is located in southwestern Germany. Over the past 10 years Saarbrücken has worked to demonstrate that solar can play an important role to satisfy energy needs and reduce greenhouse gas emissions. In 1986, in a collaborative effort with the Stadtwerke Saarbrücken (the municipally owned utility) and the state of the Saarland, Saarbrücken set out to develop what has become Europe's leading solar demonstration initiative at the municipal level. A number of solar programs were begun including a solar rooftop program with the target of installing 1,000 KW of PV capacity on

residential rooftops. Saarbrücken has paved the way for solar energy to be considered as an energy source for municipalities located in northern latitudes.

Case 2: SOLAR WATER HEATING, Midrand, South Africa

- In 1999, Midrand joined Sustainable Energy, Environment and Development (SEED), a co-operation program that focuses on sustainable energy and environmental issues related to low-cost urban housing and integrated rural development. A pilot project to promote the use of solar water heaters in a low-income residential area, called Ivory Park, was undertaken in 1999.

SEED profiled energy use for residential water heating potential amongst low-income households and analyzed consumer responses to simple mobile solar water heating devices. The study identified that low-income households welcomed the energy savings associated with solar water heating devices. Midrand EcoCity is now in the process of planning the implementation of solar water heating systems in Ivory Park. The project's objective is to reduce CO2 emissions as well as the remove barriers to increase purchase and usage of solar water heaters. The plan is to equip 9000 homes in Ivory Park with solar water heaters over the next 20 years.

16. Demand side investment is also a strategy that can be employed to extend existing power generation and improve reliability in power stressed areas. It can also provide a certain measure of energy security that is not dependent on fluctuating fuel or power supply. There is growing recognition in industrialized countries that some of the greatest and most cost-effective opportunities for sustainable energy development involve improving end-use efficiency by providing the same energy service with less energy inputs or, to achieve more energy services for the same energy input.

17. End-use energy efficiency improvement reduces the environmental downside of energy production. It is also an inexpensive strategy to increase access to affordable energy services and, is generally far more affordable than new supply. Large potential exists for energy savings through energy efficiency improvements in the buildings, transport and industrial sectors. Moreover, research and development of energy technology has not approached its limits in the

provision of continuing improvements to energy efficiency.

18. Local governments are uniquely positioned to promote and implement measures that reduce energy demand and improve energy efficiency. Local governments can use regulatory powers, such as those that set land use development and building standards, to facilitate decentralized energy production and efficient energy technologies. These measures have extended the local energy resources and in some cases provided access to energy services to areas without grid connection. The Better Buildings Partnership, a program between the municipality of Toronto, Canada and local private utilities, promotes and implements energy efficiency retrofits of industrial, commercial, institutional and multi-residential buildings. The program is marketed by the City and funded by the utilities through reinvested avoided costs achieved from the reduced power demand that resulted by improving the energy efficiency of the building stock.

19. Throughout the lower income regions of the world, public utilities have become unable to provide quality services on a continuing basis or to respond adequately to rapidly increasing demand. If public investments in energy decreases further and alternatives are not considered, the quality of energy services will decline further. Just as public investment was used to establish the electricity grid and distribution system, public investment should now be used to selectively encourage cleaner and renewable energy. Public investment can and should now be used to support demand side investments and decentralized energy production such as solar rooftops, biomass production, district energy systems and combined heat and power systems that can extend clean energy to people practically and at lower cost than many centralized systems.

20. Recommendations on Topic 1:

(i) *Level the Economic Playing Field For Cleaner And Renewable Energy Sources.* Reform of policies, such as the removal of subsidies for fossil fuels and elimination of levies that inhibit new clean technologies, are needed at all levels of government and multi-lateral agencies

(ii) *Encourage Investment In And Implementation Of Clean, Decentralized Energy Generation.* Local governments should be encouraged to promote and establish clean,

decentralized energy generation such as combined heat and power systems, rooftop solar, biogeneration, etc.

(iii) *Enable Implementation of Local Demand Side Measures.* Funds and policy support should be directed to local governments to implement measures that reduce energy demand in the residential, commercial and industrial sectors.

(iv) *Utilize Public Investment to Achieve Accessible and Clean Energy Infrastructure.* Public investment at all levels of government, including monetary and donor agency investment, should be directed to reduce energy demand and develop decentralised renewable energy generation.

Topic 2: Choices for Producing, Distributing and Consuming Cleaner Energy

21. It is technologically possible, and quite economically feasible, to provide heat, power or light services utilizing less energy. It is also feasible to generate electricity, whether from fossil fuels or from renewable sources, with technologies and methods that result in far less emissions and other detrimental environmental consequences. Effective policies that will result in the production, distribution and consumption of cleaner energy are those that reduce energy demand and promote both centralized and decentralized clean energy generation.

22. Despite the gains made by the industrial economies in energy efficiency over the past 20 years, per capita energy consumption is rising in every industrial country. The continuing sprawl of cities, increased demand for office equipment and household electrical appliances plays a significant role in this trend.

23. Apart from reducing the ecological risks caused by global warming, energy efficiency and demand side reduction measures create a host of environmental and public health benefits. The reduction of fossil fuel use improves local air quality by reducing emissions of nitrogen oxides, carbon monoxide, various hydrocarbons, and metals such as mercury and cadmium. These noxious gases negatively effect children and elderly people, as they are especially vulnerable to lung diseases caused or aggravated by these substances.

24. Demand side measures are key to energy and environmental sustainability. Conservation, efficiency or other demand side measures that allow a particular task to be performed with less fuel or electricity are ultimately cleaner energy measures. Demand side measures can be facilitated through national level policy such as minimum requirements on utilities and power providers for supplying specified percentages of power via demand side measures, energy efficiency standards for motors and appliances and building codes which specify energy efficiency ratings for all new construction. National government and multi-lateral financial agency investments should be geared at least equally toward reducing energy demand and generating new power supply.

25. Local governments have an especially important role to play in the demand side equation. Local government purchasing policies can give preference to energy efficient products, local building and development codes can incorporate energy efficiency standards, and public private partnerships can be established to improve energy efficiency in the commercial and residential sectors.

Case 3: ENERGY EFFICIENCY STREETLIGHT CONVERSION, Naga City, Philippines

- Naga City plans to convert existing mercury vapor lamps in 10,000 streetlights with energy-efficient sodium vapor lamps to reduce 20% of the city's electricity use.

Case 4: REDUCING ENERGY DEMAND, Portland, Oregon, USA

- The City of Portland has implemented an array of demand side measures. Energy efficiency retrofits of municipal buildings and efficient design of new municipal buildings and facilities has cut 9.5 million kWh of electricity and saved the City $1.3 million in energy expenditures. Portland's Home and Multi-Unit Weatherization Program provides energy efficiency services to homes and apartment dwellers. To date over 20,000 households have received energy efficiency improvements with $2.5 million saved in reduced energy expenses over the past 10 years.

26. Air pollution emission trading and credit schemes are now in place in a number of countries. Emission reduction credits reward those who take action to reduce their pollutant emissions thus

encouraging pollution reduction actions. Credits for emission reductions provide an incentive to find the most cost-effective way to reduce emissions, since once an emission reduction credit is created, it can be sold on the open market.

27. Emission credits should be extended to demand side activities. Legislation to award credit for emission reductions has the potential to generate important benefits, but could also result in serious problems if credits are obtained for actions that do not produce "real" emission reductions. Emissions reduction credit schemes should always adhere to practices that produce real environmental and economic benefits. It is important that appropriate protocols are put in place for both industrialized and developing countries because of the different nature of their economies and energy systems.

28. Compressed natural gas and renewable energy sources such as wind and solar are generally a cleaner energy source than coal and other fossil fuels. Cleaner energy production, for fuel types such as coal, is technologically available, such as coal conversion technologies that turn coal into a gas or liquid that can be cleaned and used as fuel. Combined cycle coal systems are some of the most efficient as they use the residual heat from the coal burning to also generate electricity. But clean energy production is thwarted by subsidies that support fossil fuel mining and production and by the lack of clear regulations that would set standards for clean energy production.

29. To facilitate cleaner energy production for all fuel types, whether fossil, renewable or other, national standards need to be set that regulate energy generation and place limits on the pollution and emissions generated from power plants regardless of fuel type.

Case 5: INTEGRATED GASIFICATION COMBINED CYCLE PLANT, Indiana, USA

- The Wabash River Generating Station is one of the cleanest coal-fired facilities in the world. Originally a 1950s steam turbine, the steam turbine was repowered and a new syngas fired combustion turbine was installed. The plant utilizes locally mined high-sulfur coal. The syngas is generated from gasification of a coal/water slurry. The syngas flows to a heat recovery unit producing high pressure steam that is then used to drive the steam turbine. Particulates in the gas are removed and recycled where the remaining carbon is again

converted to syngas that is then burned in a gas turbine to produce electricity. All exhaust heat is recovered and used to produce steam for the steam turbine to produce more electricity. Thermal efficiency of the plant is quite high, the greater the thermal efficiency the less coal is needed to generate a given amount of electricity. The SO2 emission rate from the plant is less than one-tenth the limit set for 2000 by the acid rain provisions of the US Clean Air Act. Particulate emissions are also less than approved EPA standards. The success of the IGCC technology used at Wabash is an ideal model for conversion of older coal plants and for standards for new coal powered generation.

30. In many cases, local governments have a better track record than national governments in the development and promotion of clean energy production. Local governments have effectively implemented district energy systems, systems using combined heat and power, solar generation using commercial and residential rooftops, and recovery of landfill or sewage methane to generate electricity.

Case 6: SEWAGE AND WASTE METHANE FOR ELECTRICITY, Brisbane, Australia

- At the City of Brisbane's Luggage Point sewage treatment plant, methane is being converted into electricity, offsetting approximately 5% of municipal electricity consumption. A landfill gas project is using recovered gas to heat a municipal swimming pool. In 1999, these initiatives saved the city more than $1 million in electricity costs.

Case 7: USE OF COMBINED HEAT AND POWER, Copenhagen, Denmark

- Copenhagen expanded its district heating system to cover 95% of the city's heating needs. The city used its regulatory authority to mandate compulsory connection to the system and prohibited installation of electric heating in new buildings. Copenhagen is also converting most of the City's coal fired boilers to natural gas. The natural gas generating stations are less expensive than coal-burning counterparts. The aim is to triple the use of natural gas for power generation, resulting in a 5% reduction in CO_2 emissions (260,000 tonnes) and cleaner air.

31. Consumers should also be guaranteed a clean energy choice. This can be achieved by

electricity market restructuring or new standards on electricity production that provide customers the ability to select either a clean energy source or their own power provider. Information must be provided to all customers on contract terms, cost, generation sources, and emissions characteristics of power being offered. Local governments can prepare the community by informing them about new opportunities in purchasing power from renewable energy sources, such as solar, wind, biomass, or hydroelectric.

Case 8: RENEWABLE ENERGY POWER AGREEMENT, Portland, Oregon, USA

- The City of Portland developed a contract with an electric utility to guarantee that 5% of electricity available to utility customers was generated from new wind power sources, resulting in 4million kWh switched to wind power.

32. Recommendations on Topic 2:

(i) *Prioritize Demand Side Investments*. National government and international policy and monetary agencies prioritizing investment in demand side programs will extend capability of power supply and energy resources.

(ii) *Encourage Local Government Implementation of Demand Side Measures*. Local governments should be supported to implement policies that reduce energy use such as energy efficient building codes, purchasing policies and district power schemes that utilize co-generation or combined heat and power systems.

(iii) *Credit Energy Efficiency in Trading Schemes*. Emission trading schemes should give credit to demand side measures and not only reward measures that improve power generation.

(iv) *Set National Standards for Clean Energy Production*. Ceilings on standard air pollutant and carbon emissions promote clean electricity generation and provide consumers a clean energy product.

(v) *Fund Research and Development of Clean Technology and Renewable Energy*. National governments, and international monetary and donor agencies need to direct funds to produce state of the art clean technologies and renewable energy generation.

(vi) *Utilize Small Scale and Decentralized Energy Production.* Small scale energy production from renewable sources such as solar, methane can facilitate production and distribution of clean energy

Topic 3: Methods, Including Public Private Partnerships, to Achieve Cleaner, Sustainable Energy for Transport

33. The combustion of fossil fuels to provide energy for transport vehicles produces carbon dioxide, methane, nitrous oxide, hydrocarbons, and carbon monoxide. These polluting emissions are generated throughout the entire vehicle and fuel cycle from the assembly and manufacturing through to extraction, distribution, and end use. Fossil fuel powered vehicles are now the primary cause of rising emissions of greenhouse gases and air pollutants in urbanized areas.

34. There are many different approaches advocated to reduce polluting emissions from vehicles. While "end of pipe" technologies such as catalytic converters help reduce the emissions that contribute to smog formation their impact on CO_2 emissions, the primary greenhouse gas, is nil. The optimal means to reduce all categories of emissions is to decrease the consumption of petroleum-based fuels. This can be achieved through improved vehicle technologies, alternate fuels or reducing the use of motorized vehicles through such measures as car sharing, promoting pedestrian and bicycle travel and, as discussed in the next topic, reduction of travel demand.

Case 9. CAR SHARING, Bremen, Germany, various cities in Europe

- Organised car sharing is a network of users with vehicles designated for shared use. In areas with good transit and land use design, a private vehicle is not needed for daily travel. The purpose of car sharing is to provide the flexibility of a vehicle for those times when a vehicle may be necessary without the need and expense of sole ownership. Car sharing reduces the energy consumption, noise and air pollution of individual mobility. Car sharing organizations have developed mainly in Switzerland, Germany, Austria and the Netherlands. The organizations have a pool of cars at the disposal of their members. The cars are located at reserved parking spaces and can be booked by the members 24 hours a day. In Bremen, the car sharing organization was a joint project of the City and a private company, StadtAuto.

Bremen has 34 locations distributed throughout housing areas meaning the user has only a short walk or bicycle ride to access the car.

35. One of the most effective means to decrease consumption of petroleum-based fuels is through improving vehicle fuel efficiency. Practical, technically feasible designs for high efficiency vehicles exist and it is well within the capability of automakers to produce them. Such a paradigm shift will need action by all levels of government and the private sector to motivate manufacturer changes.

36. Traditional vehicles, such as bicycles and three wheelers or motorized rickshaws are a practical and viable alternative to larger motor vehicles. Bicycles are often an appropriate choice for urban travel. Their use should be promoted by national and local government policies to ensure that bicycles are given an equal playing field economically and equal access to infrastructure to support safe use.

37. In many Asian cities the two-stroke auto rickshaw is a common mode of transportation. The two-stroke engine in most auto rickshaws is a notorious producer of air pollution emissions. however, auto rickshaws can be designed with fuel-efficient, lower polluting engines. Rather than eliminating this traditional vehicle, better technologies for auto rickshaws should be encouraged. A project in Bangladesh aims to replace all inefficient and highly polluting two-stroke engine auto-rickshaws with high efficiency four-stroke engine vehicles. Each efficient vehicle will reduce gasoline consumption. The more efficient auto-rickshaw engines will achieve higher local air quality due to reduced emissions of lead and particulate matter improving the health of rickshaw drivers, passengers, and local inhabitants.

38. Kathmandu, Nepal has begun a program to promote electric powered auto rickshaws, eliminating tailpipe pollution. Such programs are optimal when the electricity can be generated from a renewable source. To charge electric vehicles, the City of Santa Monica, USA has installed solar photovoltaic (PV) panels atop of the city-owned parking lot. These panels can charge seven electric vehicles at a time. The electric car drivers simply park and plug their vehicles into the 110 volt or 220 volt outlets provided.

39. Alternative fuels, especially those formulated from renewable sources, such as ethanol from wood residue, methanol from recovered methane or electricity generated from renewable resources, also hold promise. Many governments and industries are currently implementing programs for alternative fuels. Most have focused on fuels such as natural gas and propane, both fossil fuels but with lower polluting emissions than gasoline or diesel. However, the full range of environmental and economic impacts over the full lifecycle of a fossil fuel generated alternative fuel needs to be considered. Research into the full lifecycles of various fuels rates few alternative fuels highly. Optimal is the use of the best alternative fuel in highly efficient vehicle technologies, such as hybrid and fuel cell vehicles, designed to produce ultra-low or no emissions.

Case 10: CONVERSION OF FLEET VEHICLES TO LPG, Queretaro, Mexico

- Queretaro switched 73 police vehicles from gasoline to LPG (liquid propane gas). Doing so reduced 207 tonnes of CO_2/year and significant quantity of air pollution emissions and saved the city approximately US $143,000 annually.

40. Improving the engine operation and efficiency of transport vehicles would considerably reduce environmental impacts. Motor vehicle emissions can be controlled most effectively by designing the vehicle to have low emissions. Because these controls increase the cost and complexity of design, vehicle manufacturers require incentives to produce them. These incentives may involve mandatory standards, financial inducement, or both. Since compliance with stricter emission standards usually involves higher initial costs, the optimal level of emission standards can vary among countries. Therefore, to even the playing field a strong case can be made for adopting a single set of international vehicle emission standards and test procedures for both industrialized and developing countries.

41. The U.S. Environmental Protection Agency (EPA) is announcing stricter tailpipe emissions standards for all passenger vehicles, including sport utility vehicles (SUVs), minivans, vans and pick-up trucks. This regulation is the first time the EPA is considering vehicles and fuels as one system. The EPA is also announcing higher standards to lower sulfur content in gasoline. These

new standards will require passenger vehicles to be 77 to 95 percent cleaner than those presently on the road and will also reduce the sulfur content of gasoline by up to 90 percent. As the U.S. is one of the largest vehicle markets, manufacturers worldwide will be producing vehicles to meet these new standards. There is only politics, opposition from vehicle manufacturers and resistance to uniformity that stand in the way of such standards being applied universally.

42. Most vehicles are driven in urban areas for short distances in stop and go traffic at speeds of between 20 to 40 miles per hour. Yet, manufacturers have designed most vehicles to operate maximally at driving conditions of between 55 to 65 miles per hour. An additional standard that should be considered is to design vehicles to operate most efficiently while idling and operating in urban driving conditions rather than at highway speeds.

43. Partnerships can be established between government and private sector to speed transition to better vehicle and transportation infrastructure technology. A unique collaborative of auto manufacturers, oil companies, a fuel cell company, and the State of California is "The California Fuel Cell Partnership". This Partnership aims to advance new automobile technology incorporating environmental solutions in vehicular design and fuel sourcing. This is the first time automobile companies and fuel suppliers will merge to demonstrate fuel cell vehicles under realistic driving conditions. In addition to testing the fuel cell vehicles, the Partnership will also identify fuel infrastructure issues and prepare the California market for this new technology.

44. Public leadership can help implement best practices regarding fuel and vehicle use. Governments can use their purchasing powers to buy fuel-efficient vehicles and new state of the art clean vehicle technologies, sending the market signals that demonstrate demand for these better vehicle products. Governments can also show leadership to achieve cleaner transport by downsize the number of vehicles in their fleet, minimizing vehicle use and employing non-combustion vehicles such as bicycles.

Case 11: COPS ON BICYCLES. Puerto Princessa (other cities), Philippines

- Puerto Princessa, Naga City, and Tagbilaran, Philippines have begun switching selected police officers to bicycles in order to maintain peace and order. Cops-on-Bikes has proven

extremely effective in enforcing law and order in the community, enhancing police visibility and reducing city costs. The cities have found bicycles to be an affordable and non-polluting alternative to motor vehicles. By the end of year 2000, 30 percent of the total police force in Naga City will be provided with bicycles.

45. Recommendations on Topic 3:

(i) *Set National Standards for Production of Clean, No to Low Emission Vehicles.* National standards should ensure the production of the best available efficient and clean vehicle technology. Standards should provide for vehicles that are at their optimum while idling and traveling at low, urban street congested speeds.

(ii) *Use Public Leadership to Promote Cleaner Transport.* Public leadership can stimulate widespread private action. All levels of government should implement policies to promote fuel efficient and advanced technology vehicles, downsize fleet sizes, minimize vehicle use and utilize non-combustion vehicles such as bicycles.

(iii) *Use Government Purchasing Power to Send Market Signals for Clean Vehicles.* Government purchasing policies can give preference to clean and efficient vehicles. Governments can also partner with business to encourage the production of clean vehicle technologies.

(iv) *Direct Research and Development Funds to Advanced Clean Vehicle Technologies.* Donor agencies, national government and international financial agencies should direct research and development funding to achieve advanced clean vehicle technology.

(v) *Eliminate Economic Disincentives to Clean Transport.* Taxes, fees and customs duties on better vehicle technologies, including bicycles, need to be lowered or eliminated to help achieve equitable access to cleaner transport.

(vi) *Encourage Production of Cleaner, Economic Fuels.* Multi-national oil companies controlled from the North should cooperate with developing country governments to provide cleaner, economically viable fuels.

Topic 4: Sustainable Transport Planning: Choices and Models for Human Settlements, Transportation Infrastructure and Transportation Modes

46. In studying the differences between European and North American cities, ICLEI's Urban CO_2 Reduction Project found that higher urban population densities facilitated urban settlement and development patterns, transit and transportation systems, and housing and building characteristics that resulted in lower per capita energy use. Effectively designed and managed urban areas also enhanced access to needs and services rather than reliance on transport. Yet, population density was not by itself the determinant of energy use levels. The more efficient cities were highly dependent upon transportation systems well integrated within the urban layout.

47. Excessive use of automobiles causes problems for cities throughout the world. Car-based transportation has led to low-density urban sprawl and the decline of the city center. Past and present land-use policies in most urban areas have lead to unacceptable levels of traffic congestion, longer travel times, non-sustainable levels of fossil fuel consumption, air pollution, deterioration of livability in the urban environment, and increased rates of transportation-related accidents.

48. Integrated transport systems consist of a variety of modes of transport within the city, applying each where it is most efficient. In many cities throughout the world the failure to effectively integrate transportation and land-use policies has created non-sustainable dependencies upon automobile use and weak public transit systems.

49. The key to solving these common urban problems is to re-integrate transportation with land-use planning so that the land-use pattern can support more sustainable and environmentally acceptable transport modes, such as public transit, bicycling, and walking. The effectiveness and financial viability of public transit systems, for example, is a function of the number of transit users residing along public transit corridors.

Case 12: LAND USE TO REDUCE TRANSPORTATION DEMAND, Portland, USA

- The City of Portland changed its land use policies to increase residential density along

existing transit corridors. This change has resulted in the addition of 2,500 new housing units per year in the downtown area and a reduction in the length and number of vehicle trips to the downtown. It also eliminated 2.5 million vehicle miles traveled (VMT), saved 137,958 gallons of gas and saved $179,346 in reduced fuel expenses.

50. National governments need to decentralize land use powers to allow local governments to use these powers effectively and appropriately for unique local conditions. Local governments that use land-use planning, zoning regulations, permit conditions, municipal ordinances, and bylaws can contribute to well-designed urban areas. By mixing residential density with accessibility and proximity to commercial and retail services and providing transit, along with pedestrian and bicycle friendly infrastructures, communities can have far lower per capita vehicle trips, transport energy use and resulting global warming and air pollution emissions.

Case 13: INTEGRATING LAND-USE AND TRANSPORT, Curitiba, Brazil

- Curitiba, Brazil used zoning and public housing policies to direct growth to designated corridors. These corridors were then provided with public transit services. The program built upon existing, organic land-use patterns to establish a well-defined road hierarchy, which designated specific functions for each road in the city, taking into consideration the optimal transport mode for each specific road. Once optimal transport modes were determined, the physical structures of the roads were altered to best support these transit modes.

The policy changes resulted in public transit that supports 70 percent of the average daily commuter trips on a citywide basis. The high rider use and the efficiency of the system permits operation of public transit services at a profitable level, permitting the city government to operate the system in partnership with private transport carriers. The system operates without any direct subsidy from city coffers.

51. The automobile-based transportation system prevalent today allows individuals and businesses to be extremely mobile. However, this excessive vehicle use comes at great costs to society, communities, the environment, and humans. Local governments bear a large economic burden from this dependence on the automobile. Studies have found that motor vehicle revenues cover only less than half of the cost incurred by local governments to provide the infrastructure,

maintenance and services needed by automobiles. Local governments usually subsidize the shortfall. Reducing the local automobile subsidy can save general funds that could be used for alternative transportation.

52. Many transportation systems in place have made it very expensive for individuals to purchase and insure a motor vehicle, while keeping marginal motor vehicle user costs very low. Tax systems and zoning and design standards continue to favor motor vehicle ownership and use along with low-density automobile-dependent development patterns while discriminating against dense, mixed-use, transit-oriented development. Together, these forces have promoted highly automobile-dependent areas. To make matters worse subsidies and government policies support the oil, auto, and road building industries as well as low-density land use decisions.

53. Subsidies sway consumer choice to more costly and less efficient patterns of behavior and suppress the development of many alternatives. It also creates major inequities with respect to access to mobility, as many people cannot afford the costs to own and maintain a car. Often these taxpayers are excluded from the principle form of transportation, automobiles and must rely on public transit systems that may be inadequate. Consequently, many people are unable to access employment, recreational and other opportunities that require motor vehicle transportation. Moreover, there is inequality in access between those with full access to private motor vehicles and those without, such as children and the disabled.

54. The total costs of transportation system development and operations have been hidden as external costs that affect everybody, not just the consumers or producers of mobility. The principal external costs associated with transport are accidents, air pollution and noise. Economic instruments are effective tools that local governments can use to incorporate the full costs of transportation decision into a price that the driver incurs. This is an example of the *User Pay* principle: those who use a service or resource should pay the full economic cost of that use. The principle can also assist local governments to generate finances to support transportation projects such as transit systems and bicycle and pedestrian options to reduce automobile dependency. Federal and local subsidies should be provided to those systems (walking, bicycling, public transit, passenger and freight railroads and ferries) and equipment that go further toward

achieving accessibility, convenience, efficiency, cleanliness and equity goals.

Case 14: PARKING PRICING TO ENCOURAGE TRANSIT USE, Oxford, England

- Many local governments have reduced parking space requirements and imposed high parking fees to provide disincentives for automobile use. Oxford, England has developed a comprehensive plan to reduce traffic in the downtown area, which relies on parking fees combined with improved public transit service.

In response to increasing traffic congestion on the city's radial routes and in its downtown core, Oxford adopted a transport policy that emphasizes achieving a "balanced provision for cars, public transit, cycling and walking". The city first established a park-and-ride system, with free parking at the edge of the built-up area combined with fast, frequent, and affordable bus service to the urban center. The city then implemented a pricing policy on downtown public parking to discourage cars and provide an incentive to use the buses. Designated bus lanes, other traffic management measures, and a ring of residence-only parking zones further enhanced the attractiveness of the outlying parking lots with their accompanying bus service.

Case 15: LIMITING AUTOMOBILE USE, Republic of Singapore

- The Republic of Singapore, an island city-state, has a transportation policy with the goal of safe and efficient movement of people and goods rather than vehicles. Singapore has promoted efficient land use planning to minimize the need for travel, constructed a modest network of roads and highways and an impressive public transit system, and introduced other measures to limit the ownership and use of automobiles.

With a significant investment in public transportation, Singapore has built one of the cleanest and most efficient public transit systems in the world. The backbone of the system is the bus, and numerous park-and-ride lots encourage people to take express buses from the suburbs into the city center.

To both discourage auto use and help fund transit, Singapore initiated an area-licensing scheme requiring drivers who want to enter a Restricted Zone during peak traffic periods to purchase and display a supplementary license in their car window. The area licensing has controlled traffic congestion, demonstrated that fees and vehicle quotas limit growth in

vehicle use, and provides revenue to support a comprehensive and integrated public transit system.

55. Recommendations on Topic 4:

(i) *Prioritize Access Versus Mobility*. Transportation and land use investments and policies need to ensure access to goods services and jobs rather than mobility of vehicles.

(ii) *Equitable Transportation Investment*. Transportation investments by national and local governments and monetary agencies needs to be equitable toward transit, pedestrian, bicycle and other modes.

(iii) *Implement Land-Use Policies That Improve Quality Of Life*. Local governments need to implement land-use policies that promote land uses that reduce travel demand and place jobs, shopping facilities and community services close to residences.

(iv) *Decentralization Of Transportation Infrastructure*. National governments should move to decentralization of transportation infrastructure decisions so that local governments have more say over local use of transportation funds.

(v) *Equalize Private Vehicle Subsidies*. Market measures should be in place so that vehicle users are paying in more equal proportion to transit users and users of other modes.

(vi) *True Costs Need To Be Externalized*. True costs of vehicle use such as fuels, roads, pollution, accidents, etc. need to be externalized to create economic parity for other transport modes.

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Note by the Secretary-General

Addendum

Discussion paper contributed by the non-governmental organizations*

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Introduction

1. The energy and transport sectors constitute the two major sources of greenhouse gas emissions and other environmental contaminants. For many years, governments have heavily subsidised unsustainable forms of transport and energy, with commensurate growth in demand and increasingly disastrous implications for the global environment. In both sectors, the solutions to these problems, locally and globally, must now be based on a fundamental reorientation towards reduction in consumption and a shift of government subsidies towards support for sustainable energy and transport policies, strategies, and technologies, and targeted support for disadvantaged, low-income sectors in all countries. Four key issues are discussed in this paper, with the two energy sections prepared by the CSD NGO Energy and Climate Change Caucus, and the two on transport prepared by the CSD NGO Transport Caucus. For more information about the two Caucuses, please go to the website: http://www.csdngo.org/csdngo.

Topic 1: Achieving Equitable Access to Sustainable Energy

2. **Sustainable Energy Has Minimum Negative Social, Health and Environmental Impacts.** Sustainable energy can ideally be defined as energy with positive impact on the healthy functioning of ecological systems, including the global ecosystem. At this point of time on earth, when few forms of energy can be regarded as 100% "sustainable", it may be useful to consider a working definition of sustainable energy as energy with minimum negative social, health and environmental impacts, and which can be supplied continuously to future generations on earth. Sources of energy and energy strategies can be divided into three categories: most sustainable, fairly sustainable, and unsustainable. Energy conservation, that is, reducing or preventing energy use, is certainly the most sustainable energy strategy. Certain renewable forms of energy are very or fairly sustainable. Examples of these include certain kinds of solar energy, wind energy, micro-hydropower, and biomass. Most NGOs would consider nuclear power, fossil fuels, large-scale hydropower, and large-scale use of forests for fuelwood to be unsustainable.

3. **The Current Situation: Inequity and Unsustainability**. The present situation regarding energy is one of inequity and unsustainability. Nearly two billion people, mostly in rural and low-income areas, lack adequate access to any kind of "modern" energy for electricity, cooking or heating. Fuelwood or other traditional biomass is still the main source of energy for many of these people, but the continued use of forests for fuel leads to further degradation of important ecosystems, plus destruction of sinks and increases in various emissions harmful to human health and the atmosphere.

4. At the same time, over-consumption and waste of energy resources has been occurring for a long time in industrialised countries, and now is a growing trend in industrialising sectors in developing countries. Unsustainable forms of energy have negative impacts on air, water, and land resources, plus related negative social and health impacts on humans and the ecosystems on which we all depend for our lives. For instance, besides potentially devastating impacts on climate change from carbon dioxide emissions, the burning of fossil fuels emits dangerous pollutants like mercury, lead, cadmium, sulfur dioxide, and nitrogen oxide; and the production, transport, and use of petroleum pollutes groundwater drinking supplies, soil, and the earth's oceans.

5. **The Future: Equitable Access to Sustainable Energy**. Nevertheless, the lack of access to sustainable energy by the vast majority of people on earth, in both industrialised and developing countries, provides an opportunity for all to move forward together toward a sustainable energy future. Such an equitable, sustainable energy future should have as its basis transparent energy decision-making processes with diverse participation. It would focus on very sustainable energy strategies and technologies, especially conservation and sustainable renewable forms of energy.

6. Energy influences many sectors related to development, and sustainable energy is crucial for sustainable development. The goal of governments, intergovernmental bodies, and all groups in civil society should be to ensure the availability of sustainable energy for all, both for communities now relying on unsustainable forms of energy, and for low-income and rural

communities that lack "modern" forms of energy. This goal can be best achieved by a combination of, one, governmental and civil society policies that promote sustainable energy production and consumption; and two, strong leadership by both in implementing and disseminating sustainable conservation and renewable energy strategies and technologies that already work well, especially in local communities.

7. **Action: Support Targets, Timeframes and International Cooperation in All Actions**. Governments, intergovernmental bodies, and major groups in civil society should set targets and timeframes between 2002 and 2010 for achieving all the policies and actions proposed below. All stakeholders should cooperate to facilitate the implementation of such policies and actions in order to achieve targets within the established timeframes.

8. **Action: Support Institutionalising Participation by Under-represented Groups in Energy Decision-making**. The poor, women, indigenous peoples, the disabled, youth, and low-income workers and the elderly, and other under-represented groups in civil society, should have key, institutionalised roles in energy decision-making at all levels and in all sectors, public and private. Active participation of these groups should be encouraged in all sectors producing and using energy. Participation by these groups in energy decision-making should be accompanied by initiatives in capacity building to promote linkages, networking, and understanding.

9. **Action: Support Information Access and Transparency in Energy Decision-making**. Energy decisions should be made in a totally transparent manner, including complete information access for the public. This should apply to all energy decisions by governmental and intergovernmental bodies in which public funds will be expended. But because energy policies and actions affect ecosystems and human, social and environmental health so drastically, such transparency and information access should also apply to private companies receiving any kind of government support, such as tax benefits, use of public lands, or other "subsidies".

10. **Action: Integrate the Concerns of Indigenous Peoples in Energy Land Use Decisions**. Indigenous peoples and their lands in a multitude of areas around the world have for many years been especially negatively impacted by production of unsustainable forms of energy, such as

fossil fuels, large hydropower, and nuclear power. Therefore, it is essential that indigenous peoples should have key roles in energy decisions that affect their peoples and lands.

11. **Action: Integrate Gender Equity into All Energy Policies and Programmes**. The active participation of women should be encouraged in all sectors producing and using energy, in order to bring about gender perspective and gender equity in energy policies and programme planning and implementation. Energy consumption places inequitable burdens upon women, especially in rural areas in developing countries. For instance, women spend long hours gathering cooking fuel, time that could be spent in more productive activities. The use of wood, coal, crop residues and animal wastes for cooking by women expose them to high levels of pollutants, with the result that women suffer inequitable shares of disease and premature deaths.

12. **Action: Integrate Workers' Concerns about Occupational Health and Safety and Job Re-training into Energy Policies and Programmes.** Workers in energy industries are particularly subject to serious occupational safety and health hazards, and workers' representatives should have an active role in energy decisions. Worker concerns regarding occupational safety and health should be integrated in all energy decisions. Workers in unsustainable energy industries should receive preference and assistance for re-training for jobs in industries producing or consuming sustainable energy or sustainable products.

13. **Action: Phase Out Harmful Subsidies**. The primary obstacle to the use of more sustainable forms of energy is the enormous amounts of government economic subsidies that perpetuate the myths of "cheap" fossil fuels and large-scale hydropower or "clean" nuclear power. Estimates of such economic subsidies on a worldwide basis are in the range of hundreds of billions of U.S. dollars per year. In fact, the true total is much higher, since these estimates do not include provincial/state government subsidies and many indirect infrastructure subsidies. Meanwhile, subsidies for much more sustainable renewable forms of energy such as solar and wind have not received even 1% of the subsidies that unsustainable forms of energy have.

14. Government subsidies for the production and consumption of harmful, unsustainable forms of energy should be quickly phased out. Some examples of government policies that are usually

considered economic "subsidies" are: deficiency payments for producer losses; operating grants to producers; consumer subsidies via energy retailers; price premiums; tax credits; tax exemptions, allowances, exclusions and deductions; tax rate relief; tax deferrals; preferential treatment in local rates and franchise fees; provision of infrastructure, such as land expropriation for roads and plant sites; provision of complementary services; government research and development expenditures; preferential loans; loan/liability guarantees; debt forgiveness; price regulation; procurement policies; export credits; and import/export tariffs/quotas.

15. **Action: Target Government Energy Subsidies for Poor and Low-Income People**. Some have referred to the social impact of ending economic subsidies for unsustainable forms of energy as a reason not to end them. But studies have shown that most consumer subsidies assist not the poor but the comparatively wealthy, the biggest consumers of energy. The social goals of government subsidies to consumers can be achieved, in a much cheaper manner, by government subsidies specifically targeted to the poor and low income.

16. **Action: Re-direct Funding into Incentives for Sustainable Energy**. From the monies saved from phasing out harmful economic subsidies, governments and intergovernmental institutions should fund programmes and incentives to promote sustainable energy. Economic growth would also be stimulated more sustainability if those subsidies were given instead to conservation efforts and producers and consumers of sustainable forms of energy.

17. Some governments that are pushing for competitive market reform and pricing in developing and transitional economies are the same governments that annually provide huge amounts of subsidies for unsustainable forms of energy. In fact, there would be a truly competitive market situation only if governments and intergovernmental institutions now gave similarly huge amounts of subsidies over the next 50 years in support of solar, wind and other sustainable renewables, equal to the enormous cumulative value of subsidies given to unsustainable nuclear power, fossil fuels and large-scale hydropower worldwide over the past 50 to100 years.

18. **Action: Support Internalisation of External Costs in All Energy Policy and Pricing Decisions**. External costs should be internalised in all energy policy and pricing decisions. The

price of conventional energy, already deflated because of economic subsidies, rarely reflects the further economic costs due to the negative health, environmental and social impacts resulting from the production and use of unsustainable energy, such as fossil fuels, nuclear energy, and large-scale hydropower. When one takes into account the external health, environmental and social costs, hydrogen fuel cells powered by solar energy; tidal and wave energy; solar thermal electricity; and other allegedly "expensive" renewables, are in fact already much cheaper.

19. **Action: Support Sustainable Forest Management and Restoration**. The forests sector is an especially important one, because of its impact upon ecosystems and biodiversity. To decrease the negative impacts of fuelwood use, sustainable forest management and restoration, and equitable access to and distribution of the benefits of such management, should be supported. These are necessary strategies to meet basic needs until people now using wood for fuel can achieve access to more sustainable forms of energy

20. **Action: Support Projects Focusing on Rural Areas Lacking Modern Energy Access**. Sustainable energy projects should focus on low-income rural areas that lack modern energy access. Investments could be maximised in such areas, and these projects could alleviate poverty and promote capacity building and training as well as direct income generation. Examples of such rural projects include sustainable energy systems to pump water for drinking and irrigation; to power schools and small businesses; to power computers for farmers to receive information about weather, crops, and nearby markets; to light homes for children to read at night; to power clinics or to refrigerate medicines to support rural health; and to electrify rural schools at night, converting them into community centers for adult education and training.

21. **Action: Support Prioritising Cooking Energy and Women's Health in Developing Countries**. Because cooking is the main energy use by poor women, programmes to improve energy access by women and children in developing countries should place a priority on more sustainable cooking fuels and methods, including improved biomass stoves. This could improve family health, both by reducing smoke and other indoor air pollution, and by decreasing women and children's workload in fuelwood collection and cleaning.

22. **Action: Support Micro-credit and Credit Exchange Programmes to Integrate Sustainable Energy and Poverty Alleviation**. Micro-credit and credit exchange programmes that integrate sustainable energy projects with poverty alleviation should be strongly supported. Micro-credit projects are working in many places as proven, low-cost, low-risk methods of increasing sustainable energy access while reducing poverty. Such projects can directly generate income, e.g., solar or small wind water pump systems that could increase cash crops or animal husbandry for a village cooperative. Credit exchange programmes also have great potential. For instance, solar systems can be paid for in installments with export quality handicrafts that are made using lighting at night from the electricity provided by the solar systems. After the solar systems have been paid for, their use can generate new income for the family or community.

23. **Action: Support Sustainable Energy Education and Training to Increase Access**. Human resource capacity must be developed in all energy-related institutions. Public programmes to educate people about conservation and the efficient usage of energy should be intensified. School curriculums at all levels should include sustainable energy education. Training institutes should be established specialising in sustainable energy in both rural and urban areas.

24. **Action: Support Use of Sustainable Renewables for Remote Locations Instead of Extending Unsustainable Grids.** The costs of extending electrical grids powered by unsustainable forms of energy are usually the same or higher than supplying most remote areas with home systems and mini electrical utility systems powered by sustainable forms of energy, such as solar, wind, or micro-hydro. In these cases, governments should simply not extend the grid and instead use available funds to install sustainable energy systems, and train local rural energy service companies in their use and maintenance. In addition to uses that directly support rural development and poverty alleviation, sustainable forms of energy such as solar and wind energy are also proven technologies to provide reliable power for a variety of uses in areas not connected to the grid: water conservancy systems, railway and road lighting and signals, communications, geological and meteorological equipment and stations, etc.

25. **Action: Support Strategies to Increase Access in Grid-Connected Areas.** Support should be given to various strategies to increase access to sustainable energy in grid-connected areas,

such as green pricing, renewable portfolio standards, and net metering. Green pricing programmes involve utility companies offering consumers a choice of paying somewhat higher prices for energy from "green" sources. Renewable portfolio standards (RPS) mandate a certain minimum level of renewables in the portfolios (energy mix) maintained by utility companies. In net metering, unused energy produced by residential or commercial renewable energy systems is returned to the grid, resulting in a credit to the consumer. Meanwhile, the consumer draws energy from the grid when needed (e.g., when sun or wind is lacking). Net metering reduces the need for b: :ries and expensive energy storage systems.

26. **Action: Support Establishment of an International Sustainable Energy Organisation (ISEO)**. From the monies saved by ending harmful energy subsidies, governments of industrialised countries should utilise half to finance sustainable energy programmes in their own countries. They should contribute the other half to finance the establishment and functioning of a temporary new United Nations agency, to be called the International Sustainable Energy Organisation (ISEO). ISEO would have a term of ten years, and could be extended for further ten-year terms as needed. ISEO would have four tasks:

(a) Assist countries in identifying and phasing out government subsidies for unsustainable forms of energy;

(b) Assist countries in integrating external costs in energy policy and pricing decisions;

(c) Fund conservation and sustainable energy programmes in developing countries, and especially focus on providing sustainable energy access for the poor and low-income in rural areas, and on assisting all developing countries to diversify into sustainable forms of energy;

(d) Disseminate information on sustainable energy policies and practices, and facilitate international technology transfer, cooperation and capacity building for sustainable energy.

Topic 2: Sustainable Choices for Producing and Consuming Energy

27. **Action: Support Sustainable Planning, Design, Construction, and Maintenance/ Operations**. The most sustainable choice for producing and consuming energy is to prevent its consumption in the first place. The best way to achieve this is by sustainable "green" planning,

design, construction, and maintenance/operations of all built environments; residential, industrial, and commercial equipment, machinery, and furnishings; and consumer appliances and products. Governments and intergovernmental bodies should work with civil society to set standards for sustainable design and construction. This conservation strategy has maximum sustainable impact at zero or low initial cost, and almost immediate monetary savings.

28. **Action: Support Energy Conservation Strategies and Methods in all Sectors**. Energy conservation and efficiency strategies, methods, and technologies, such as demand side management, should be applied in all sectors that consume energy, e.g., industry, agriculture, commerce, housing, transport, consumer products, water supplies, waste disposal, government and military installations, etc. Substantial monetary savings as well as energy would be saved.

29. **Action: Support Energy Conservation by Use of Alternative Options in Other Sectors**. In all sectors, conservation can also be achieved by using alternative options, which are often quite cost effective as well as environmentally benign. For instance, a study on solid waste prevention showed that it cost U.S. $150 per ton to landfill; $250 to recycle; $300 or more to incinerate; but only $20 to prevent or reduce one ton of waste. Waste prevention would therefore eliminate altogether the significant energy use in the three conventional methods of waste disposal. Similarly, encouraging organic farming and less reliance on petrochemicals in agriculture would reduce energy consumption, and ecological means of wastewater treatment would consume much less energy than the equivalent chemical wastewater treatment plants.

30. **Action: Support Training of Architects in Passive Solar Design for New Buildings**. Passive solar design involves maximising the use of energy from the sun by the way a building is designed, including building orientation, solar use of certain building materials, "solar" landscaping, placement of windows, etc. Using passive solar design can achieve as much as 80 to 90% reductions in energy use for heating, lighting, ventilation and cooling the building. Small investments in training architects, especially in developing countries, in this technology can produce large savings in energy and energy expenditures at little or no financial cost.

31. **Action: Support Investments in Energy Conservation and Efficiency Instead of New Power Plants**. Each time a new power plant is being considered, cost-benefit analyses should be done to consider whether the potential investments would receive a better return if they were instead used for energy conservation projects. For instance, utility companies could establish additional energy services companies to do energy audits and sell energy conservation and efficiency products such as low-wattage compact fluorescent bulbs to consumers.

32. **Action: Support the Most Sustainable Renewable Energy Strategies and Technologies**. After reducing energy requirements through conservation, remaining energy needs can be supplied by sustainable renewable forms of energy. Some of these, notwithstanding the relative lack of subsidies, are already cost-effective in all or certain circumstances: solar cookers; wind mechanical water pumps; windpower for electricity on and off-grid; solar photovoltaics (PV) for electricity and agricultural uses in remote areas; hybrid wind-solar; solar collectors for heating and hot water; biogas; and micro-hydro and pico-hydropower.

33. **Action: Support Dissemination and Training in Use of Low-Cost Solar Cookers**. Inexpensive solar cookers can be designed and constructed locally for a variety of uses in addition to cooking: water purification, crop drying, desalinisation, etc. Solar cookers have no harmful pollutants and can free women to do productive activities near the cooking. Cookers made locally of indigenous materials are the most sustainable, and are ideal for cooking staples such as rice, beans, yams, potatoes, etc. The small financial investments required for constructing cookers and training users should be widely supported.

34. **Action: Support Dissemination of Wind Mechanical Water Pumps**. Wind mechanical water pumps, an old technology, have recently been updated. New wind mechanical water pumps can now pump very deeply, while running on low wind speeds. For instance, one new kind of advanced wind powered mechanical pump can run at 5 m/s, at a depth of 30 meters, and pump water at the rate of 240 liters/hour, enough to supply a small village with clean water plus extra water for income-producing activities.

35. **Action: Support Dissemination of Modern Wind Turbines for Electricity**. Electricity from modern wind turbines is now cost-competitive with fossil fuels, with costs per kWh as low as U.S. 3 to 4 cents. When appropriately sited, small and large-scale wind turbines are suitable for both industrialised and developing countries. New wind technology includes very powerful turbines that are becoming smaller in size while operating with increasing efficiency. The "Windforce 10" campaign has shown that wind energy can provide 10% of the world's energy by the year 2020, and should be strongly supported.

36. **Action: Support Dissemination of Solar Home Systems (SHS) for Off-Grid Areas**. Complete small solar home systems, including 50 watt photovoltaic (PV) panels, battery, controller, lights, wiring, and installation, at a cost of less than U.S. $500, are selling well in many developing countries. Needing little maintenance, often with warranties of 10 to 20 years (although the PV panels can last even longer than 100 years), such systems are providing electricity and promoting income-producing activities. Typically, rural energy service companies (RESCOS) rent or sell such systems on credit at a charge of U.S. $10-15 per month.

37. **Action: Support Dissemination of Hybrid Wind/Solar PV Systems**. Hybrid wind/solar systems can be the ideal sustainable solution to areas with inadequate solar irradiation, but which have strong winds in the evening. Storage batteries may therefore not be necessary, decreasing the cost of a hybrid system compared to using only wind or solar energy. New, easy-to-use computer programs take into account more detailed wind and irradiation data and allow almost anyone with a computer to design the most cost-effective custom hybrid system possible.

38. **Action: Support Dissemination of Solar Collectors for Heating and Hot Water**. Solar collectors for heating and hot water are an established technology, produced locally in many developing countries. Mass production of solar collectors has reduced costs, to such an extent that rooftops of cities with nearby solar plants will often be covered with solar collectors. The costs situation has also improved in several European countries.

39. **Action: Support Dissemination of Sustainable Biogas Systems**. Certain kinds of biogas systems are fairly sustainable. Biogas produced by anaerobic digesters at low temperatures using

wastewater effluent or other residues from agriculture are being utilized in both developing and industrialized countries, in residential, commercial, and industrial sectors. The resulting biogas is used for cooking fuel, heat, or generating electricity.

40. **Action: Support Micro-Hydropower and Pico-Hydropower**. Micro-hydropower (1 kWe-100 kWe) and especially pico-hydropower (less than 1kWe) are the most sustainable forms of hydropower, with almost none of the negative environmental, social, and health impacts of large-scale hydropower systems. However, costs vary considerably, and they require careful site determination and planning (e.g., consistent water flow, etc.) to achieve a successful project.

41. **Action: Support Decentralised Energy Cogeneration**. Systems for cogeneration of heat and power (CHP) have become more efficient. Cogeneration is cost effective because two types of energy are generated by one system, and can often reduce wastes substantially from industrial plants. Cogeneration also promotes sustainability by allowing smaller, more decentralised energy systems that can use different types of renewables depending on the situation.

42. **Action: Support Production and Use of All Kinds of Sustainable Renewables**. If economic subsidies for unsustainable forms of energy are taken into account, many other sustainable energy strategies and technologies are already cost-competitive and should be supported where possible: ambient heat flow pumps, solar thermal electricity, geothermal energy in appropriate locations, tidal and wave energy, building-integrated photovoltaics, fuel cells powered by sustainable forms of renewable energy, etc.

Topic 3: Public-Private Partnerships to Achieve Sustainable Energy for Transport

PROBLEMS

43. **Motorisation.** Rapidly increasing motor vehicle use remains the biggest challenge to developing sustainable transportation systems. Industrial nations, while accounting for less than a fifth of the world's population, continue to account for about 60 percent of transport-related energy use. Vehicle ownership rates are still on the increase in all OECD countries. Growing

vehicle sizes and miles traveled have overtaken fuel efficiency gains. These countries therefore bear a special responsibility for reducing transport-related emissions and energy use.

44. However, motorisation growth rates are presently highest in less industrialised countries (LICs). While petrol use in industrialised countries is growing by 1% per year, it is growing by 6% in Asia and Latin America. This growing motor vehicle use is only partially offset by the modernisation of old polluting vehicle fleets with newer, cleaner, more fuel-efficient vehicles. Motor vehicle use is much greater than optimal because fuel, road space, parking, and other facilities are frequently heavily subsidised, while the external costs they generate are not internalised. Further, many trips short enough to be made by walking, cycling or other non-motorised modes are made by motor vehicle due to poor road safety conditions.

45. In the last two decades, the role of the public sector in transit provision and low income housing has declined. Growing private sector involvement is a response to both fiscal and managerial problems within public systems. Governments have sometimes pursued privatisation of transit systems to undermine unionised labour, while doing little to improve bus system efficiency. Public transit's share of passengers has declined precipitously in virtually all cities where transit vehicles have not been given priority access to the road network, regardless of whether the systems are in public or private hands. As public bus services deteriorated, they have sometimes been replaced by weakly regulated paratransit services with few worker protections.

46. Cutbacks in state support for low-income housing have pushed the poor to build self-help housing in remote locations locking the poor into long term dependency on motorized travel.

47. New mechanisms for public and private cooperation should allow the reassertion of public control over the urbanization process in a context of regulated private provision.

48. **Transport-related Emissions.** The transport sector represents nearly 30 percent of total emissions of carbon dioxide, the primary contaminant responsible for global climate change. Further, with rapid growth in motor vehicle use in the developing world, the sector is also the

fastest growing source of greenhouse gas emissions. Unfortunately, none of the over 150 AIJ mitigation projects developed have been transport related, and GEF funding in the sector is only now beginning.

49. From the standpoint of human health, other emissions are of greater concern. Levels of lead, suspended particulates (TSP), nitrogen oxides (NOx), ground level ozone, carbon monoxide (CO), and volatile organic compounds (VOCs) are rising sharply in many developing country megacities, causing serious health problems. Leaded gasoline remains a major problem in Africa, Asia and Latin America, thought its phase out is well under way in many developing and virtually all developed countries. An estimated 1.1 billion urban residents worldwide are exposed to TSP levels in excess of World Health Organization (WHO) recommendations.

50. Most tailpipe emission controls, ambient emission controls, and fuel and fuel efficiency standards in developed countries were implemented in the face of initial opposition from the motor vehicle industry. Cleaner technologies will play a role in emission reduction, but are no panacea. Hydrogen-fuel cell vehicles may become viable, but life-cycle CO2 emissions from fuel cells are currently higher than for natural gas vehicles. The emissions from electric vehicles depend on how the electricity is generated. Adoption of these new technologies in developing countries, and most importantly the fuel distribution supply infrastructure, will remain prohibitively expensive. Supplies of these alternative fuels and vehicles are also likely to be monopolistic in the short term. Setting a regulatory framework and targets based on energy efficiency and public health, then allowing the private sector to meet these targets in the most economically viable way is better than having governments and development agencies second-guess which technologies will best meet these targets and pour scarce resources into their development.

51. Aviation is the mode with the largest emissions increases in the last decades. Global air passenger traffic already exceeds 2.6 million passenger traffic miles per year. Air travel is more energy intensive and emits more CO2 per passenger mile than most other form of travel. International agreements continue to prevent the taxation of jet fuels, presenting a de facto subsidy to this unsustainable mode. UN agencies responsible for regulating international air

travel are dominated by corporate interests. Airports and civil aviation have received a disproportionate share of financial support and technical assistance from IFIs and UN donor agencies given this mode serves no low-income people and generates enormous pollution with virtually no emission controls.

SOLUTIONS

52. **Curbing Motorisation.** The first priority is to remove the public subsidies, which disproportionately benefit high income private motorists at the expense of public transit passengers, pedestrians, and cyclists of more moderate means. Fuel prices vary globally by a factor of 100, ensuring that there is nothing rational about the level of aggregate demand for oil. Increasing fuel prices and taxes is thus a key priority. Increasing charges for urban parking and road use in congested areas are the second priority.

53. For such policies to succeed politically, the poor and middle class must be insulated from adverse effects. Critical to this is creating safe and pleasant environments for anyone wishing to walk or bicycle. Most people want to own a motor vehicle, but they also want to live in safe pollution free communities, and shop in a pleasant environment free of traffic and pollution. As, tourism and services are the growth sectors of the global economy, while the motor vehicle industry is part of the old, heavy industry-based economy, the economic importance of liveable cities is increasing. This is creating more opportunities for cooperation between NGOs and these new economic sectors for pedestrian and bicycle-friendly downtown revitalization efforts. Modernization does not necessarily mean motorisation, and the overarching goal must be to move people rather than vehicles.

54. Effective, affordable and attractive public transit is also critical to reducing dependence on private motor vehicles and subsidized oil. Most experts agree that either transparent and effective public control (as in many developed countries) or private competition for the transit market established by local authorities based on user needs, are the best mixes of public and private control. Local authorities are increasingly using service quality, safety, and tailpipe emissions standards as criteria for awarding contracts to public or private operators competing for routes.

Public capital investments to clean up even private bus fleets can be made rewards for good private service delivery.

55. Modernization does not necessarily mean motorisation, and the goal must be to improve people's access to services and jobs, rather than the movement of vehicles.

56. **Reducing Transport-Sector Emissions.** Hopes for reducing global transport sector emissions ..ould not be placed on the voluntary commercial adoption of unproven and difficult to disseminate high-technology solutions, such as hydrogen fuel cells and other alternative fuel technologies. Where markets are developing for these technologies, they are being driven by regulatory requirements. Given the proven inability of public agencies to "pick-winners," public authorities and international agencies should place their emphasis on developing fuel efficiency targets, enforcing global minimum tailpipe standards, (perhaps based on EURO II), global minimum fuel standards, and global minimum ambient air quality standards (perhaps based on WHO guidelines). Decisions about which technologies will prove to be the most commercially viable should be left to the private sector. A stronger justification exists for public support of technological innovation in human powered vehicles than for unproven alternative fuel technologies. As these modes are predominantly used by the poor the profit margins on these vehicles are low, and the manufacturers and consumers risk-averse, technological innovation tends to stagnate, undermining the ability of these non-polluting modes to compete with motorized modes.

ACTIONS AND PARTNERSHIPS FOR CHANGE

57. **Actions for UN and International Development Institutions:**

(a) Support an international tax of jet fuels earmarked to environmental clean up.

(b) Set up a process to develop and encourage the adoption of global minimum standards for tailpipe emissions, including those for motorcycles and three wheelers.

(c) Set up a process to develop and adopt global minimum ambient air standards.

(d) Provide technical support for local/national governments to enforce these standards.

(e) Support downtown revitalisation efforts, focusing on pedestrian friendly environments.

(f) Technical support for public transit and non-motorized transport prioritisation.

58. **Actions by Governments:**

(a) Eliminate fuel subsidies and charge appropriately for parking, road use and other car-based services, as well as environmental and safety externalities.

(b) Agree on the implementation of a global phase-out of leaded gasoline, and the global phase-out of highly polluting two-stroke motorcycle engines.

(c) Agree on ambient air quality standards based on WHO minimum standards.

(d) Manage demand for road space by private motor vehicles, rather than accommodating it.

59. **Actions by Private Sector:**

(a) Work with governments to ensure a transition to lead-free fuels & low-emission vehicles.

(b) Develop standards for safer car, bus and truck fronts and side panels, more visible (for bicyclists and pedestrians) turn indicators and develop safer designs for locally used vehicles in LICs (e.g. Tuk-tuk, jeepney, three-wheeled scooter taxi, etc).

(c) Support the development of global fuel standards and tailpipe emission standards so that companies cannot use lower emissions standards to compete on cost.

(d) Develop partnerships for downtown revitalization and pedestrianisation.

(e) Form strategic partnerships with NGOs to use, modernize and promote human powered and fuel efficient delivery vehicles, public transit prioritisation, increased parking fees, and congestion pricing.

(f) Use non-motorized and clean delivery and trucking services.

(g) Encourage employees to carpool, vanpool, bicycle, or use public transit by giving transit vouchers, and comply with tailpipe standards.

(h) Invest in green transportation technologies.

60. **Actions by NGOs:**

(a) Press governments, international agencies, and private corporations to implement the above recommendations.

(b) Create users groups for pedestrians, cyclists, and public transit riders to push for better services and represent their interests during transportation planning and budgeting processes.

(c) Build public awareness of sustainable transport issues.

Topic 4: Sustainable Transport Planning: Choices and Models for Human Settlements and Vehicle Alternatives

PROBLEMS

61. **Land Use.** Transport is a derived demand. Co-locating housing, jobs, and shopping can remove the need for a motorised trip into perpetuity. Land use regulation in the past created obstacles to mixed-use activity centres. Zoning, generally controlled at the local level, is primarily used to protect the property values, rather than to promote higher density, compact, transit-focused development which would greatly reduce energy consumption and emissions. With transport and other infrastructure costs borne by the state, developers take advantage of lower land costs at the urban periphery, dramatically increasing motor vehicle use. Land use regulation has rarely proved an effective way to change this. Withdrawal of the state from the housing and transit sectors further reduced the state's ability to intervene in this process.

62. **Traffic Safety and More Sustainable Travel.** In many cities a majority of trips are under 5km, and could easily be made by walking or cycling, but they are made by private motor vehicle even in poor neighborhoods, because of disastrous road safety conditions. In 1999, an estimated 1.171 million people died in traffic accidents. In countries like India, as little as 5 percent of those killed are in cars. Children and elderly pedestrians, cyclists and motorcyclists remain the most vulnerable road users. Traffic engineers have focused on increasing vehicle speeds rather than safety.

63. Trips by walking, bicycling, and public transport, (which involves a walking trip on either end), will never increase unless traffic planners can guarantee that these trips can be made safely. Parents will not allow children to use public transport if they have an unsafe walk to a bus stop. Elderly people and women, often unable to drive, are forced to stay home and become socially isolated.

64. While ultra-light vehicles have made possible dramatic improvements in fuel efficiency, families worried about safety are buying ultra-heavy vehicles, compromising fuel economy.

65. **Equity.** While the vast majority of the global population depend on walking and head-loading and will never own a motor vehicle, less than 2% of development investments benefit these modes. This mobility burden has kept many of the world's women locked in poverty.

66. Although cycle rickshaws and vending carts play a critical role providing jobs and transport services in many lower income countries, particularly for women and the elderly, governments continue to restrict their use. Such restrictions cannot be justified from a traffic management perspective.

67. The ability of women, elderly, ethnic and racial minorities, and disabled people, to meaningfully participate in society require access to employment opportunities and critical services. Women spend a disproportionate share of their day meeting basic household needs. Disabled and elderly people are unable to participate meaningfully in society and have access to critical services if their particular mobility needs are not addressed.

68. **Infrastructure Investment-Decision Making.** The prioritisation of transport sector investments is rarely based on rational economic or environmental criteria. New roads are built while old roads crumble in defiance of economic rationality. Highways and high-speed rail lines are built connecting powerful political constituencies, while roads in low-income areas remain made of mud.

69. Traffic planning and cost benefit analysis, when used, generally ignore non-motorised travel, leading to measures which improve motor vehicle speeds but compromise the safety and convenience of pedestrians and cyclists. In developing countries in particular, this bias tends to disproportionately hurt lower income groups and women. Cost benefit analysis rarely considers the precautionary principle that avoids plans or projects, which present serious risks to the environment, public health, and safety. Lower cost alternatives to new construction, such as traffic demand management measures, are rarely considered. The impacts of induced demand are also rarely included in the analysis.

70. **Pricing Issues.** While governments and development agencies are loathe to provide direct capital subsidies for public transit, wheelchairs, bicycles, wheel barrows, and draft animals that would directly benefit low income populations, they are willing to spend billions on highway infrastructure and fuel and parking subsidies that disproportionately benefit wealthier people with access to motorised vehicles.

SOLUTIONS

71. **Promoting Sustainable Land Use and Compact Cities.** Governments can actively promote compact, mixed-use city centres. European governments refuse to grant building permits in auto-dependent locations when more central locations better served by transit remain available. Municipalities and state governments can refuse to provide the necessary infrastructure at sub-optimal sites. German, English, and Dutch governments, which have used these powers, have saved billions for their taxpayers. Government involvement is often required to facilitate higher density development in more central locations, but the necessary government institutions to facilitate this process in developing countries need to be nurtured. Governments need to become more involved in higher density, accessible housing development, creating mechanisms where housing vouchers and one-off capital grants can be applied to higher density housing as well as rehabilitating existing housing stock. Land banking coupled with low income housing creation around planned public transit corridors has also effectively reduced travel demand in Singapore, Hong Kong, and Curitiba. Private banks and development banks could also encourage the recent development of "location-efficient mortgages."

72. Ring roads, ostensibly built to facilitate "through-traffic," make sense for small cities, but in large cities, tend to primarily subsidise out-of-town auto-dependent big box retailers, at the expense of smaller scale retailers in the centre.

73. **Improving Traffic Safety.** The safe use of road facilities by all types of traffic should be the basic design principle for roads and intersections, rather than the maximization of motorized traffic speeds alone. Sweden has made "zero fatalities" the primary guiding principle of transportation planning. The US FHWA has made safe use of road facilities by all types of traffic, both motorised and non-motorised, a critical design criteria. Extensive traffic calming

design standards have been developed that should be more widely adopted. Traffic safety improvements should initially prioritise access to schools, traditional markets, transit stations, and major employment centres for lower income people.

74. The vehicles themselves should also be subjected to design standards which ensure the safety of passengers both in other vehicles and pedestrians and cyclists. Truck and bus front-ends can be designed to minimize the severity of such injuries.

75. Governments and courts could criminalize manufacturers of vehicles with designs known to have adverse safety consequences for vulnerable road users. WHO could develop vehicle design guidelines to provide advice to governments. Weight restrictions could be imposed on passenger vehicles, and tightened on commercial vehicles allowed to operate in urban areas.

76. Road and highway design standards need to be developed in all countries which ensure safe operation by non-motorized as well as motorized traffic on all but limited access freeways. Courts could hold municipalities liable for non-compliance with these standards in the event of serious accidents.

77. **Boosting Public Transport.** An exclusive right of way for public transit vehicles, transit prioritisation at controlled intersections, pre-boarding facilities, fare structures encouraging multiple use, low-floor, wide-doorway buses, and a host of other factors have proven to increase public transit usage, whether implemented by a private or public operator. Curitiba, Brazil, Quito, Ecuador, and now Kunming, China are successful examples. More modest examples also exist throughout the US and Europe. Such bus-system focused improvements are much cheaper than metro or light rail improvements, which should only be implemented in high-density corridors once bus-system needs and improvements have been addressed.

78. All public transit facilities should be accessible to the elderly, the disabled, and women and men with children. Transit systems should also provide secure bicycle parking facilities, especially in suburban areas with lower station densities, and should facilitate safe access by non-motorized means.

79. **Boosting Non-Motorised Transport.** In addition to the safety measures suggested above, governments need to remove restrictions on the use of cycle rickshaws and bicycles on major urban roads serving short distance trips. Facilitating movement by wheelchair is also critical to enhancing the mobility of the disabled and the elderly. Governments could also provide one-off capital grants, and micro-credit to increase non-motorized vehicle ownership. Business training and other small and medium enterprise support could be provided to support the emergence of the bike retail sector.

80. The development of national and city-level bicycle masterplans would be another critical element in boosting cycle use, as is done now in Seoul, New York, Bogotá, and many other cities. In order to be effective, these plans should pro-actively aim at a significant increase of the non-motorised mode share for utilitarian trips, and not be targeted at recreational cycling.

81. Non-motorised transport should also be integrated into all transportation planning, beginning with the collection of basic data on non-motorised travel and non-motorised vehicle ownership in all household surveys and road traffic counts. Such planning activities should be driven by a process of public participation in which transit users, service providers, and local officials work together to develop sustainable transport solutions.

82. **Increasing Equity-Responsiveness.** The impacts of transport investments and service arrangements on women, the elderly, and the disabled in particular need to be studied and considered before project implementation. Disaggregated analysis of these different types of users is a necessary part of a general re-orientation of transport planning away from a focus on facilitating the movement of motorised vehicles to a people-centred perspective that starts with an analysis of the basic household mobility needs.

83. **Making Infrastructure Investment-Decisions More Sustainable.** Only at the strategic planning and policy-making level is it possible to still consider modal alternatives. The goal of transport and traffic planning should be reaching traffic safety and environmental targets, as well as the more traditionally measured economic goals such as increased motor vehicle speeds and

reduced operating costs. Such analysis must include the impacts of proposals on non-motorised traffic and on other modes in the same corridor. The project should be a pre-approved project evaluated in an overall strategic environmental impact assessment for the region. Alternatives analysis should still be performed to determine whether or not the same access needs could not be better met at lower cost by traffic demand management measures or improvements in public transit systems. New infrastructure investments should be considered only after basic maintenance of all existing systems has been addressed.

84. **Getting the Price Right.** The full health, environmental, and economic costs of transport should be reflected in all prices within the transport system. Subsidies to users should only be provided when justified to reduce poverty, improve access to disadvantaged groups, promote more environmentally sustainable modes, or to compensate for existing subsidies in favour of less environmentally sustainable modes.

ACTIONS AND PARTNERSHIPS FOR CHANGE

85. **Actions for UN and International Development Institutions**

(a) Require data collection and analysis by governments of project impacts on non-motorized travel as a prerequisite for project funding.

(b) Provide necessary technical support.

(c) Initiate a multi-national task force on vehicle and road safety design standards.

86. **Actions by Governments**

(a) Promote mixed-use development, downtown revitalisation, and accessible low income housing.

(b) Develop land use regulations that prioritise the development of existing brownfield sites in central or transit-accessible locations and restrict big-box greenfield development.

(c) Make cities pedestrian and car-friendly, and wheelchair accessible.

(d) Promote car-free days.

(e) Move towards requiring Strategic Environmental Assessments (SEA) for major transport plans, policies and comprehensive investment projects.

(f) Develop and implement guidelines for urban road and intersection designs and traffic calming for country specific traffic patterns.

(g) Collect all household and user surveys in a sex-disaggregated manner to facilitate gender analysis.

(h) Increase the penalties for causing road traffic accidents.

87. **Private Sector Actions**

(a) The bicycle industry should become much more involved in working with governments to improve safety conditions for bicyclists.

(b) Develop voluntary standards for safer car, bus and truck fronts and side panels, more visible (for bicyclists and pedestrians) turn indicators and develop safer designs for locally used vehicles in LICs (e.g. Tuk-tuk, jeepney, three-wheeled scooter taxi, etc).

88. **NGO Actions**

(a) Organize users to participate meaningfully in the transportation planning and implementation process.

(b) Participate in programs to improve the access of disadvantaged groups to modes of transport, which directly improve their access and mobility.